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THE
QUEENSLAND AGRICULTURAL JOURNAL,

ISSUED BY DIRECTION OF

THE HON. THE SECRETARY FOR AGRICULTURE.

EDITED BY A. J. BOYD F.R.G.S.Q.

NEW SERIES.

VOLUME X.

JULY TO DECEMBER, 1918.

BY AUTHORITY:
ANTHONY JAMES CUMMING, GOVERNMENT PRINTER, BRISBANE.

1918.

QUEENSLAND AGRICULTURAL JOURNAL

VOL X.

JULY, 1918.

PART 1.

Agriculture.

RICE—THE COMING POWER.

Last April we received from Mr. J. F. Keane, of Carbeen, Mareeba, N.Q., who is a successful enthusiast on the subject and practice of rice-growing in North Queensland, the following article on "Paddy Rice for the Distillery," for the manufacture of spirit fuel, a subject he dilated on in this journal in October, 1914. He now writes:—

"There is much more—very much more—to be said about it. Rice spirit is to-day the cheapest spirit in the world, aquadenti in Brazil, arack in India, samshoo in China, sake in Corea. All neat O.P. rice spirits seldom run the ultimate consumer, on the very last turnover, much more than a penny a pint. Between the latitudes of Cape York and Cape Capricornia, we have nearly 3,000 miles of longitude and 1,200 miles of latitude uninhabited, more than half of which, on a very conservative estimate, is capable of yielding 70 bushels of rice to the acre. All the implements for sowing and harvesting already exist in very perfected forms. The mechanical operation of producing alcohol from the raw material is very simple and requires little plant. The denaturing of it for industrial purposes presents no difficulties. So that Northern Australia holds an everlasting fount of liquid fuel for all the world.

"The disproportion in bulk between the finished product and the raw material, the value and uses of the residues, and the necessity of having a little of the fuel produced for operating the works, make it advisable that the manufacturing be done in the locality in which the material is grown. Circumstances which appeal to me only for the best in these great 'loan' lands.

"In more than one place in the report the above conditions are stressed as disadvantages.

"In discussing molasses, an objection raised is that 'A great quantity is produced in outlying parts of Queensland, and it hardly seems feasible to regard this raw material in the northern districts of Queensland as a profitable source of liquid fuel for use in parts of Australia far distant from Queensland.'

"With an extract from a weighty English trade journal, I shall close:—

" 'One of the most disturbing factors in the commercial world to-day is the petrol famine. Should further developments of its use continue at the pace they have been doing, petroleum fuel will soon become exhausted for ordinary commercial purposes.'

"A last word to the farmer. Tropical Australia only differs from all other tropical rice countries in that, like the Deccan Plateau, which it resembles in every minutest particular, it is one of the very best of them. Tropical countries are the most delectable and the most prodigally fruitful on the face of the earth. Grow rice and start a co-operative or private still."

Mr. Keane mentions that he had received from the Secretary to the Commonwealth Advisory Council of Science and Industry a copy of an interim report of a special committee on alcohol fuel and engines:—

"On the first showing, molasses looked promising, but, it appears, if all the molasses in Australia were taken for alcohol, it would only make one-sixth of the motor fuel at present being used. Maize is next considered in this wise. 'Allowing that 5,000,000 gallons could be obtained from molasses, it would require 283,000 acres of maize with an average yield of 25 bushels per acre at 2s. a bushel (in New South Wales, it is mentioned, for some reason not at once apparent) to provide raw material for the remaining 15,000,000 gallons required, at the present price of petrol.'

"All the other possible sources of supply dealt with, and their name is legion, are hopeless from a business point of view.

"Which brings me to the quite inexplicable omission, the provoker of this letter. Not once does the word rice appear between the covers of the book."

In a letter dated 18th April, Mr. Keane says that during the late cyclone all the long grass on the savannahs up North was laid as flat as if a steam roller had been over it. On the third day after the cyclone it was all standing up as erect as ever. Precisely the same thing happened to the rice. He saw several paddocks where the rice crop was looking well and just bronzing.

RUST IN WHEAT.

Replying to a correspondent, writing from World's End Creek, for information respecting smut in wheat, the Director of Agriculture (Professor Arthur J. Perkins) said:—"I notice that you complain that in your district smut was very prevalent in the crops last year, even in the case of those that were pickled, and you wish to know whether any reason can be given for this unfortunate condition of affairs. In the first place, it would be necessary to know whether you are referring to 'loose smut,' which appears early in the season, before the grain is ripe, or to what is more generally known as 'bunt,' which is easily recognised by the characteristic of a disagreeable odour which it emits. Generally speaking, pickling is without effect against 'loose smut,' since it is not so much the grain that is affected as the land on which the crop is sown. 'Bunt,' however, can, in my experience, be completely checked by an efficient pickling, and if, in this direction, you and your neighbours have failed, apparently, in the past season, I can only attribute it to defective pickling. It would be interesting to know in this connection how you proceeded. The question of pickling has been referred to so often in the pages of the journal, and by officers of the Department of Agriculture in different parts of the State, that it seems almost unnecessary to refer to it again. I shall, however, indicate briefly the precaution that should be taken when wheat is pickled. In the first place, pickling by immersion of a bag in a tub of bluestone solution is not effective. It is absolutely essential that the grain be thoroughly stirred up whilst in contact with the pickle, and I know of no more efficient method for the purpose than the old-fashioned floor pickling carried out thoroughly. I have very little confidence in the various pickling machines that are now in the market, because, in my view, they do not stir up the grain sufficiently for the purpose. In order to secure good results, you should, in my opinion, proceed as follows:—Place the grain to be pickled on a wooden floor, and pour over it a 1 per cent. solution of bluestone (1 lb. of bluestone to 10 gallons of water) until the solution runs freely away from the grain. The wheat should be turned over vigorously with wooden shovels, and, if necessary, a little more solution may be added from time to time. I must point out that for effective action it is not strength of pickle that counts, but the quantity you use in the mixing-up process. If your grain is somewhat badly affected with smut, do not increase the strength of the pickle, which would only have the effect of injuring the germinating powers of the grain, but use the 1 per cent. solution very freely. I am perfectly satisfied that if you follow out these instructions carefully, and if, in addition, you do not put your wheat back into dirty bags, and if your drill is clean and free from germs of smut, you will have no reason to complain of your crops next year. As a matter of precaution, it is wise to immerse old bags, into which the pickled seed is placed, into the pickle solution before filling them with grain."—"Journal of Agriculture of South Australia."

CASTOR OIL.

The castor oil plant will thrive almost anywhere on the coast-lands of Queensland. In and around Brisbane and other coast cities it may be seen growing and bearing heavy crops of seed in all sorts of out-of-the-way places—on the river banks, in quarries, on unoccupied allotments, &c.—and this applies as well to other coastal localities in Central and North Queensland. No attention, however, has been given to it with a view to turning this valuable plant to profitable account. The plant is exceedingly hardy and will stand a wide range of climate. The seeds, unlike most oil seeds, have extraordinary vitality. Seeds known to have been kept for fifteen years in a bottle have been sown by the writer, near Brisbane, and have produced healthy plants.

In a tropical, or even in a sub-tropical climate, the plant becomes a perennial tree instead of an annual, often attaining a height of from 15 to 20 ft. The plant should thrive well at Thursday Island.

The best soil for castor is much the same as that required for the cotton plant—a rich, well-drained, sandy loam. It will not thrive on heavy, wet, clay soils. As the roots penetrate very deeply, the land must be deeply ploughed and well worked. The seed is planted in rows 6 to 8 ft. apart each way, three or four seeds being planted in a hole. Before planting, they should be softened by having hot water poured over them, and then being left to soak for twenty-four hours. In ten days after sowing the seeds will germinate, and when the plants are 8 or 10 in. high, the three weakest must be taken up where four seeds have been planted together. They grow very rapidly and begin to bear in about four months. Like coffee plants, the castor plant would grow to an inconvenient height if left to itself. It should, therefore, be kept low by pinching back the main stem. This will have the further effect of causing the plant to throw out many more fruit spikes than it otherwise would do. When the tree gets old, the usual scale insect (the *Coccus*) attacks the bark. These have to be dealt with by spraying with kerosene emulsion.

HARVESTING.

When the capsules turn brown, it is time to begin the harvest. This is done by cutting off the spikes and removing them as soon as possible to the barn. The work of harvesting must be done rapidly, for if the seeds are allowed to ripen on the tree, the pods burst open and the seeds fly in all directions. This "popping" of the capsules makes the work of freeing the seeds a very simple one. All that has to be done is to prepare a drying ground either in a shed or in the open. The ground should either be boarded or swept clean. When the spikes are brought in, they should be spread out on the drying ground to the depth of from six inches to a foot, according to the heat of the weather. Should rain occur when out-of-door drying is being carried on, draw the spikes into heaps and cover with a tarpaulin. Turn the spikes over frequently to let all get the benefit of the sun. The capsules will soon begin to burst, and in four or five days they will have shed all their seed. All that now remains to be done is to sift and winnow out the husks. When drying in the open, it is well to surround the drying spikes with a low rampart of galvanised iron or bagging, for the reason that many seeds fly out very violently, and without some such precaution would be lost.

The return from an acre is about 20 bushels, a bushel of seed weighing 46 lb.

EXTRACTING THE OIL.

Those who would venture to embark in the production of castor or other oil seeds have to face the fact that the market is too far distant to leave a margin of profit after deducting the cost of production, freight and other charges. The only remedy, therefore, is to bring the market nearer, and this can only be done by bringing the



PLATE I.—CASTOR OIL PLANT. FLOWER AND SEED SPIKES.

oil-miller alongside the raw material. The actual outlay in erecting an up-to-date oil mill is not large, as will be seen by the following (pre-war) estimates:—

Capacity of Mill.				Cost.
				£
30 to 45 cwt. of castor per day	..	..	..	750
40 to 70 cwt. of castor per day	..	..	..	1,050
100 to 150 cwt. of castor per day	..	..	..	2,400
160 to 200 cwt. of castor per day	..	..	..	3,000



PLATE 2.—CASTOR OIL MILL.

Skilled labour would be required to make the oil. A comparatively simple process can be tried, however, with good results. It is as follows:—

First cleanse the seeds from fragments of the husks and from dust, and submit them to a gentle heat, not greater than can be borne by the hand, which process makes the oil more fluid and more easily expressed. A whitish oily fluid is thus obtained, which is then boiled with a large quantity of water, and all impurities

are skimmed off as they rise to the surface. The water dissolves the mucilage and starch, and the albumen is coagulated by the heat, thus forming a layer between the oil and the water. The clear oil is then removed, and boiled with a small quantity of water until steam ceases to rise, and a small quantity taken out in a phial remains perfectly transparent and cool. The effect of this is to clarify the oil and rid it of volatile acid matter. Care is necessary not to carry the heat too far, as the oil would acquire a brownish colour and an acid taste. Cheap wooden rollers would serve the purpose of crushing, the seed being placed in hempen bags.

A MARKET

would be probably found for oil seeds in Melbourne or Sydney. There are no oil mills in Queensland.

THE WHEAT PLOT.

We avoid having sheep-sick soil by rotating the sheep land with the wheat, breaking up each year a new 100-acre plot for the wheat. Thus the cycle gives the various parts of the farm four years in sheep and one year in wheat. After the wheat we sow turnips, and subsequently rape on part of the 100 acres, sowing down the whole field at the same time in grass. This entails some outlay for seed, and it is difficult to say whether this should be charged to the sheep (which will eat the product) or to the wheat (which has made new sowings necessary). Our best plan here is to dodge the difficulty, and leave this again to the critic to account for. A fence also is necessary for the 40-acre plot. This may be either temporary or permanent. A few 40 and 60-acre paddocks are handy things to have on a sheep farm, and they will not greatly impede the wheat growing.

A TEMPTING SIDE ISSUE.

It would be a very profitable undertaking to sow the whole of the wheat plot subsequently down to turnips and rape, with a view to buying some extra lambs for fattening. Specially prime rape crops have been known to add 4s. per head to fifty lambs per acre. If we make our expectations reasonable, and put the result at twenty lambs per acre, we get an extra £4 per acre from the spare sixty acres of rape, besides, perhaps, a similar earning from the preceding turnips—a total side income of £480. Against this we may reasonably set the cost of seed, regrassing and such manuring as we may choose to apply. It will be well agreed that this system of farming will, in all probability, cause a steady increase of fertility, even apart from the purchased manure, which, however, will speed up that increase, and more than pay its way while doing so.

COST OF A WHEAT CROP.

The laying down of wheat out of grass is fairly well standardised practice. We may outline it like this:—

	Per Acre.		
	£	s.	d.
Preparation (including skim ploughing, discings, the deeper ploughing, harrowing, sowing and rolling) ..	1	2	6
Seed, 2 bushels at 5s.	0	10	0
Manure, 2 cwt. super. at 7s. 6d.	0	15	0
Total	£2	7	6

	Per Acre.		
	£	s.	d.
Harvesting—			
Cutting and twine	0	5	6
Stooking	0	2	0
Forking, carting, and stacking	0	10	0
Threshing, say	1	2	6
Total	£2	0	0
Cost of laying down	2	7	6
Total cost of 40 bushels wheat	4	7	6
Total value at 5s. on trucks	10	0	0
Net balance per acre	5	12	6

At 6s. per bushel the net balance shows at £7 12s. 6d. At 4s. per bushel, which is a more likely prospect for the future, the farmer has £3 12s. 6d. per acre to pay him for his own work, enterprise, risk, and rent. At that figure, he will not be hard to persuade to give all his energies to sheep. At 3s. per bushel, and a prospective balance of £1 12s. 6d. as his slender defence against a bad season, one wonders how any man could possibly survive the temptation to resign from wheat farming.—“Farm,” Sydney.

MARKET GARDENING.

SEASONABLE NOTES ON RHUBARB-GROWING.

Now is the time to plant rhubarb. Deep, rich, sandy loams provide ideal conditions for rhubarb, which, however, may be grown successfully on all types of soil put in the proper condition. The richer and deeper the soil, the quicker will be the growth. The bed ought to be trenched to a depth of 2 ft., and very heavily manured with good stable manure mixed with cow-yard manure. In the fertilising of rhubarb, the grower has four things to consider:—(1) That the plant luxuriates in soils abounding in vegetable matter; (2) that large stalks count for good prices; (3) that the early pullings are in most demand; (4) that the crop of any given year depends largely upon the care of the plants of the preceding year. Stable manure is especially valuable, because it supplies humus, conserves moisture, and furnishes plant food. In Europe, gardeners apply as much as 25 tons to the acre, equal to 350 lb. per square perch. Failing stable manure, commercial fertilisers may be used. Such should contain 4 to 6 per cent. of nitrogen, and 8 to 10 per cent. each of the mineral elements. Of this, about 1,000 lb. per acre, or about 6 lb. per perch, nitrate of soda is of great value when used at intervals throughout the growing season. With proper care plantations will produce for many years, but after the stalks become materially smaller they should not be retained. The best profits cannot be realised after five years of age.

The plants are readily produced from seed sown under glass or in the open, but as only a small proportion of such plants are true to type, the system should not be generally practised. Root division is the method ordinarily employed. A piece of root containing a strong eye will grow, and under favourable conditions, produce a good plant in one season. Roots should be one or, preferably, two years old. In planting, the rows should not be less than 4 ft. apart, and the plants 3 ft. apart in the rows. The ground should be kept well cultivated and free from weeds, and all flower stalks should be cut off as soon as they appear. No plant responds more liberally to judicious watering than rhubarb. Enormous amounts of water are used by the large leaves and succulent stems. Liquid manure applied occasionally is of great benefit.

By purchasing crowns and dividing them, rhubarb fit for use can be obtained in two or three months instead of having to wait for two years for seedlings to come to maturity. Hence, it will be found more profitable to purchase strong, sturdy crowns than to go to the trouble of raising seedlings, which will probably not be very strong or vigorous.

A CHEAP FERTILISER.

Mr. B. Jewitt, Buderim, sends the following note on a fertiliser which he has used successfully for many years for growing florist flowers and vegetables:—"Collect a dray load of cow dung, not too wet, from a paddock, and make it into a round heap, covering it with a layer of sods. Then set fire to it to char the dung. The charring destroys all seeds. When cool it is fit for use. It must on no account be allowed to get wet before using. If not wanted at once, put it into bags and keep dry. Any rough bones charred with it will be also beneficial to plant life."

A FARMER'S REMEDY FOR THE FRENCH BEAN FLY.

Referring to Mr. Jarvis's article on the Bean Fly, Mr. R. J. Scott, of Wanda, Walla (Mount Perry district), says:—

"My first experience of this fly in the Brisbane district was in the autumn of 1893-4, ten years before the dates mentioned in the article; and I would like to add, for the benefit of unfortunate growers, my plan for combating the fly. Four days, say, after planting the seed, cover the rows with a light layer of sawdust. Then wet this with a dressing of kerosene emulsion with a watering-can. When the plants are in the second leaf, again dress with the emulsion. To make kerosene emulsion, I use 1 lb. of ordinary soap, cut up, and dissolved in about 2 gallons of boiling water. When dissolved, add cold water to 4 gallons and three-quarters of a pint of kerosene, well stirred in with a flat piece of board. The emulsion must be warm when used, and kept well stirred."

[This is a very simple remedy, and well worthy of a trial by gardeners and others who frequently suffer the loss of an entire crop owing to the ravages of this fly.]

SPRAY WASH FOR VEGETABLES.

The following spray, or wash rather, was stated by Mr. S. C. Voller, Instructor in Fruit Culture to the Department of Agriculture, to be an infallible means of destroying aphids and other insect life on vegetables. With Paris green the trouble is that it will not stick to the glossy leaves of cabbages and cauliflowers, but collects at the base of the stalk and at the junction of the stalk and leaves. Sprays are open to the same objection. The wash here recommended, however, will stick like varnish, and, in an instant, destroy all animal life on the plants:—

TO MAKE THE WASH

take 20 lb. of resin, 4 lb. of caustic soda (98 per cent.), or 6 lb. (70 per cent.), 3 pints of fish oil, or 2½ lb. whale oil soap, and 140 to 150 gallons of water. Place all these ingredients in a boiler, first, with 20 gallons of the water, and let the whole simmer for three hours. Then add hot water slowly, and stir well till there are at least 40 gallons of solution. Then add cold water to make up the 140 or 150 gallons. Never add cold water when cooking. This wash, using only 80 gallons of water, will destroy the mussel, glover, and white scales on citrus trees, and the mussel scale of the apple. The weaker solution in 140 to 150 gallons of water may be used on all vegetables with safety.



PLATE 3.—STANDARD MILO.



PLATE 4.—FETERITA (SOUDAN DHOURA).

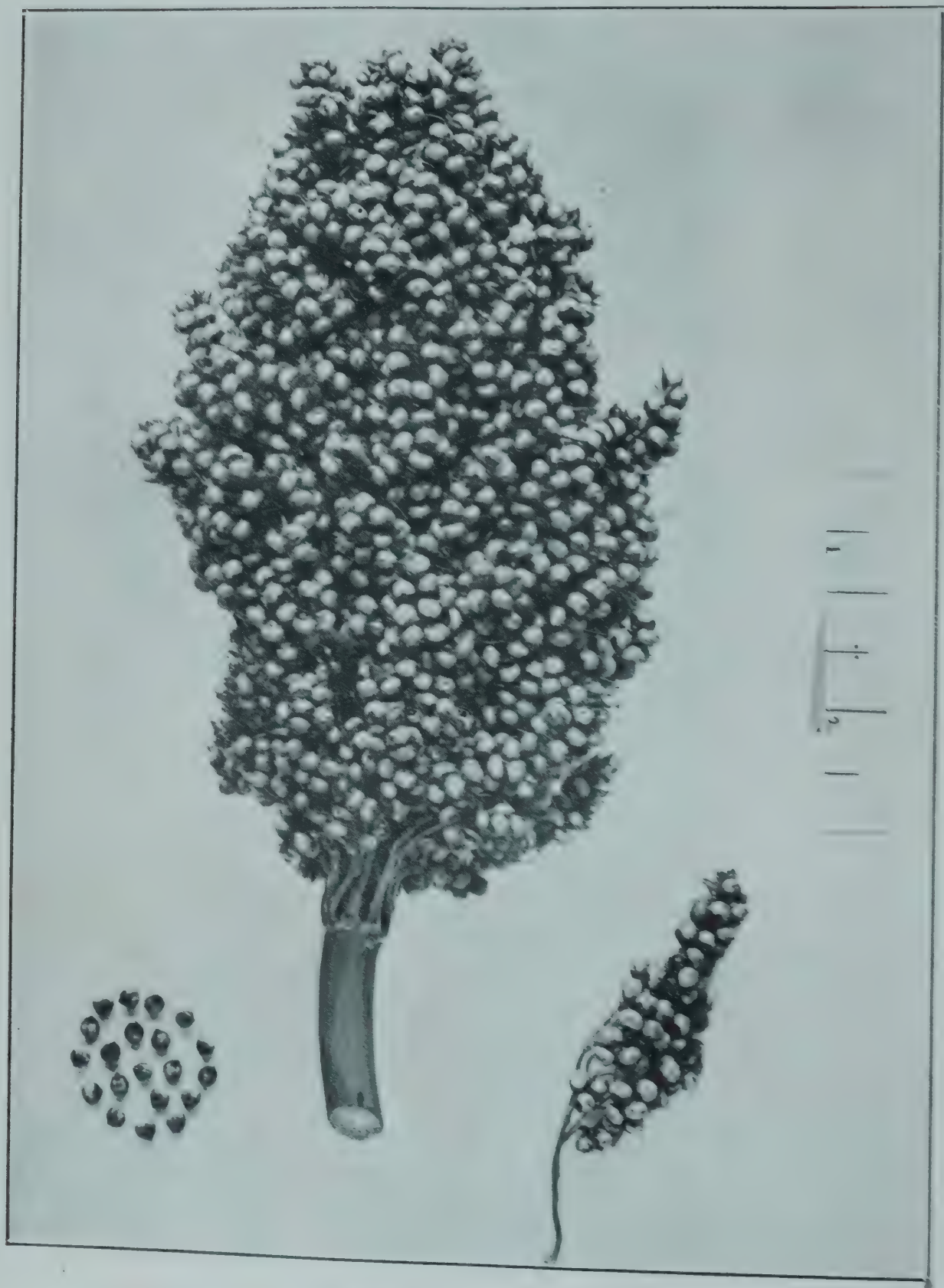


PLATE 5.—CREAM MILO.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Books is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson ..	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane ..	Paringa Farm, near Cairns	5	21	Do.
John Anderson ..	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin ..	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi ..	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.

DAIRY BREEDS—*continued.*

GUERNSEYS.

Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia
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HOLSTEINS.

Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman ..	"St. Athan," Wyreema	12	47	Do.
F. G. C. Gratton ..	"Fowlerton," Kings-thorpe	1	15	Do.
R. S. Alexander ..	Glenlomond Farm, Coolumboola	1	3	Do.
Ditto	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings ..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff ..	Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.
E. Swayne	West Plane Creek, Mackay	1	2	Do.

ILLAWARRA.

A. Pickels	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	Ramsay	2	22	Do.
Hunt Bros.	Springdale, Maleny ..	3	62	Do.

MILKING SHORTHORNS.

P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	Torran's Vale, Lane-field	1	9	Do.
W. Middleton	Devon Court, Crow's Nest	3	27	Do.

BEEF BREEDS.

SHORTHORNS.

T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan ..	"Arubial," Condamine	3	6	Do.
W. B. Slade	E. Glengallan, Warwick	2	20	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
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BEEF BREEDS—*continued.*

HEREFORD.

A. J. McConnell	.. Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill	.. Bellevue House, Bellevue	45	127	Do.
Tindal and Son	.. Gunyan, Inglewood	50	400	Do.

SUSSEX.

James T. Turner	.. The Holmwood, Neurum	2	4	Sussex Herd Book of England
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SHOWER SHEEP DIP ON CASHMERE WEST.

Mr. W. G. Brown, Instructor in Sheep and Wool, supplies the following directions for the construction of a shower sheep dip, which he saw in action at Cashmere West, on the Balonne River, near St. George, and which, he says, will doubtless interest a good many pastoralists. It differs in some respects from the specifications issued by this Department. It is, so to speak, double-barrelled, and is the first of the kind he has seen. It will be interesting to those who are thinking of dipping, because it is being used by a hard-headed, practical man. Mr. Brown adds: "I do not know whether corrugated iron is better than flat iron for the shower. In any case, I believe the shower dip to be the best medium for the work."

SPECIFICATION.

Capacity.—4,000 sheep per day.

Measurements.—30 x 24 ft., in two separate dips, each 30 x 12 ft., each of which can be worked independent of the other.

Roofing.—This is of galvanised corrugated iron, with a fall each way of 1 in. from the centre, made in two separate trays 30 x 12 ft. Holes in the trays 3 in. x 3 in. apart are made with a punch the size of No. 10 wire.

Flooring.—Cement 4 in. thick, set on a foundation of stones 10 in. thick. The floor has a slight fall to the centre for drainage.

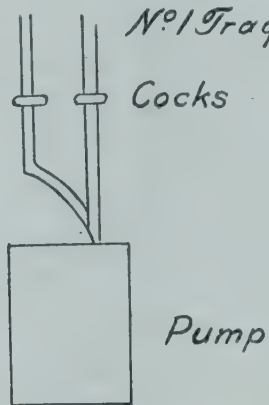
Supports.—8 x 4 in. posts, each post 7 ft. out of the ground, and 7 ft. 6 in. apart.

Rafters.—On supports only 7 ft. 6 in. apart.

Walls.—Closed in with galvanised iron, except in the centre, where the top sheets are kept down for observation.

Pump.—Three-inch Tangye centrifugal, driven by a 4 h.p. Walesby petrol engine.

Supply Pipes.—Three-inch pipes leading from pump to each separate tray as *Nº2 Tray* and pipes over trays bored with $\frac{1}{2}$ -in. holes $1\frac{1}{2}$ to 3 in. apart.



Reservoir.—Round in shape; walls 4-in. concrete, 9 ft. across, 4 ft. deep at sides and 4 ft. 10 in. in centre. Two 2-in. pipes 6 in. from top of reservoir, with bagging strainer to let in clean water from bore drain.

Straining.—Many methods were used which proved useless on account of the heavy flow of liquid. The trouble was mastered in the end by using an ordinary cheese-cloth bush mosquito net, which had to be cleaned out every couple of runs.

Although the flow of water was supplied by 3-in. pipes, it took a full flow in a 6-in. pipe to take it away off the floor to the tank, and even then there would be 3 in. of liquid in the centre of the pen, which was a danger to sheep getting down and drowned if the pens were too full.

Working.—Gates on both ends of each pen, while the supply pen, before entering the dip, was floored with battens to prevent dirt being carried in.

After draining, the sheep are let out into the drying yard. It was found necessary to discontinue dipping at about 2 p.m. on account of the cold nights, which were very severe on sheep dipped late in the afternoon.

DIPPING AS A PREVENTIVE AGAINST INTERNAL PARASITES OF SHEEP.

The subjoined extract from "The Veterinary Record," London, contained in the Annual Report of the Government Veterinary Bacteriologist, Southern Rhodesia, S.A., for the year 1916, has a strong bearing on the conclusions drawn by the Department of Agriculture and Stock in this State *in re* the dipping of sheep. These experiments in Rhodesia are almost identical in method with those of some of our Departmental experiments on Gindie State Farm and Dalmally, Roma District. Mr. W. G. Brown, Instructor in Sheep and Wool, says:—"I have long been of the opinion that dipping in a poisonous dip has a beneficial effect in cases where stomach worms are prevalent, and am glad to get corroboration from so excellent a source as the above well-known journal. The following is the extract above alluded to:—

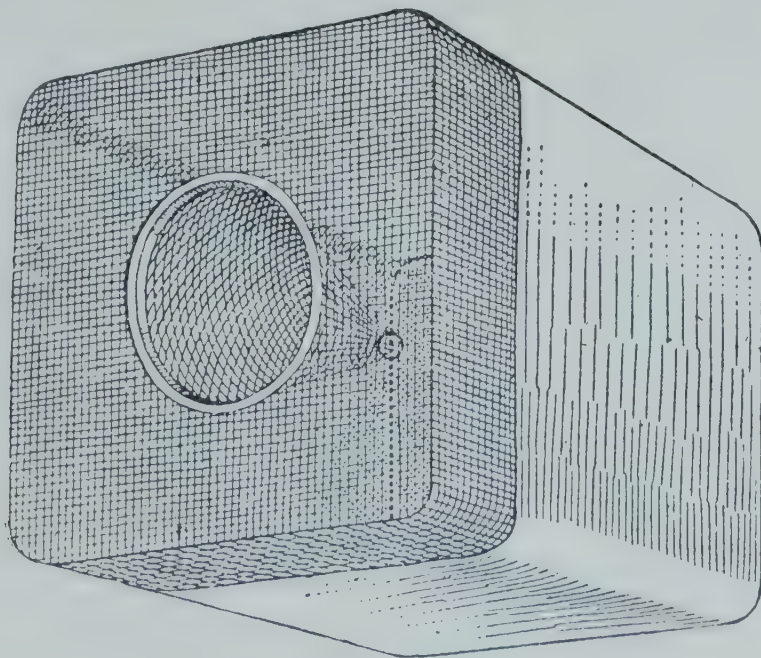
DIPPING OF SHEEP.

"Reference may be made to an experiment carried out at the request of the Chief Veterinary Surgeon to ascertain the effects of 'short interval clipping' upon sheep and lambs. A small flock made up of 39 sheep and lambs of mixed breeds,

the majority being half-bred Persians, but six of long-woolled varieties, was purchased for the purpose. All these animals were in a most emaciated condition, and suffering from fluke, wire-worm, tape-worm, and nodular worm of the intestines. It was with difficulty that they were driven from the farm from which they were purchased to the laboratory. On the 5th February dipping was commenced in Cooper's dip, 1 in 300 strength, in which they were immersed three times in ten days, the strength of the dip then being increased to 1 in 250. Dipping was carried on regularly twice a week in this strength until the 16th April, making 19 dippings in all. During this period, ten animals died—namely, four sheep (one woolled), and six lambs, these being the weakest of the flock. The rest of the flock improved markedly in health. The experiment was then discontinued, but the result is still apparent in that the survivors are still alive and in the best of condition, and the ewes have given birth to lambs, which have thriven and grown out in spite of the fact that most of them have been born during the dry season. The experiment was originally intended to determine to what extent small stock could be dipped with safety in areas which have to be freed from African Coast fever. It is possible that such drastic measures could not be applied in a damp atmosphere, or to woolled varieties—because of damage to the fleece; but, in practice, this would not be necessary. The experiment has, however, gone further; it affords support to the observation of officers in the field that dipping exerts a beneficial action upon sheep infected with worms. The results have been so remarkable that when opportunity arises, further experiments of a more exact nature will be carried out."

A SIMPLE TYPE OF BLOWFLY TRAP.

The question of destroying sheep-maggot flies by trapping them before they have time to deposit their eggs upon the sheep has been advocated by the New South Wales Department of Agriculture for some time, and a number of sheepowners have been trapping flies in various ways, with very marked results.



A number of different traps have been advertised, and placed on the market by dealers, some at a price almost prohibitive where large numbers are required. Mr. J. L. Froggatt, B.Sc., officer in charge of the N.S.W. Government Sheep-fly Experi-

ment Station, has been experimenting for some time with a view to producing a simple trap, at a very low cost, that can be set and looked after by any station hand.

The illustration shows one that can be made on any homestead by a handy man with an empty petrol or kerosene tin, and some wire gauze.

HOW TO MAKE THE TRAP.

The end is removed from a kerosene tin and the open space covered with galvanised wire gauze which overlaps the sides of the tin about two inches, and around which it is bent. Let into the wire gauze covering is a funnel four inches across at the top and five inches in length, the opening at the apex (*i.e.*, into the tin) being about the size of a threepenny piece. The inside of the tin is painted white with cold-water paint; if the outside is also painted the life of the trap will be prolonged considerably.

This type of trap has been tested at the Government Sheep-fly Experiment Station, and has also been used by many pastoralists with excellent results.

For a bait any offal (although the heart, liver, and lungs are the best), putrid meat, dead rabbits where obtainable, or milk which has been left to go sour and then putrefy, can be used with very satisfactory results.

This trap is to be used upright, not on its side, as in the illustration, which is only to show the type of funnel, &c.—“Pastoral Review.”

SPRAYING CATTLE IN TRANSIT.

Several years ago we (“Pastoral Review”) advocated a system of spraying cattle in hot weather *en route* in the railway trucks, as in Argentina and other countries which are in advance of Australia in the matter of stock-conveying methods. In hot weather in those countries the trains are run under showers, the roofs of the trucks slide open, the cattle get a shower, and the train passes on with little delay, and no shunting. However, we cannot expect anything so sensible here, so must get the next best method available. A Mr. G. S. Davis, of Sydney, has been for several years conducting experiments with this object. His scheme is to fix an iron tank on each cattle wagon. The tank is filled with water at the starting point, and is expected to last a whole journey, even up to 500 miles. The spray is regulated, and can be turned on by the driver in charge at any time.

The spraying keeps the cattle fresh and cool. It means a cool truck in the hottest day of summer. The cattle consequently suffer less, waste less, and don't fall down. It is profitable as well as humane. The cattle are better, and look better.

On a long journey in summer fat cattle waste a good deal. This spraying saves a lot of that, and in this way alone it should mean a considerable gain to the owner and the country. Then, again, it is claimed that the cattle are much less likely to go down. In eight big trips with the sprayed truck not a single beast was lost. On the same trips, in the unsprayed trucks cattle did go down. The cattle in the sprayed truck don't get so leg weary, and they remain fresh.

Dairying.

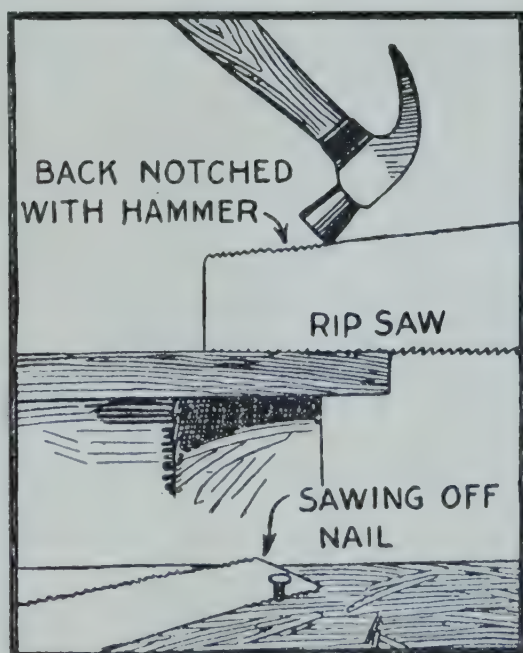
THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FROM 30TH APRIL TO 29TH MAY, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Melba ...	Holstein ...	31 Mar., 1918	1,177	3·3	42·91	
Lady Margaret ...	Ayrshire ...	28 Dec., 1917	558	4·6	28·87	
Constancy ...	„ ...	7 April, 1918	677	3·6	27·08	
Charming Damsel	„ ...	1 May „	558	4·3	26·90	
Lady Peggy ...	„ ...	30 Mar. „	573	4·0	25·60	
Leading Lady ...	Jersey ...	26 Dec., 1917	378	6·0	24·88	
Charity ...	„ ...	24 April, 1918	439	4·9	24·25	
Lady Spec... ..	Ayrshire ...	19 Feb. „	640	3·4	24·08	
Dawn of Warragaburra	Jersey ...	4 May „	463	4·6	23·95	
Jeannie	Ayrshire ...	13 Dec., 1917	504	4·2	23·70	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	584	3·5	22·66	
Leda's Jessie ...	Jersey ...	25 Mar. „	433	4·5	21·89	
Royal Mistress ...	Ayrshire ...	13 Mar. „	518	3·7	21·31	
Yarraview Ida's Hope	Guernsey ...	5 May „	405	4·6	20·95	
Belinda	Ayrshire ...	14 Jan. „	469	3·9	20·39	

SAWING NAILS.

When working up old timber it often happens that nails buried in the wood are encountered, to the detriment of the saw. This difficulty can be overcome as shown in the accompanying sketch published in the "S. A. Farmers' Advocate":—



The nails may be sawn through without injury to the saw, by notching the back edge of the saw with a hammer as here shown, and using this edge to saw through the nails. If the notches are made small, this will merely add to the saw's usefulness.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MAY, 1918.

The total number of eggs laid during the month was 5,979. The Dixie egg plant again wins the monthly prize in light breeds with 154 eggs, while Nobby Poultry Farm wins amongst the heavies with 154 eggs also. It has been a good month for egg production. Although westerly winds were prevalent during the second week, it is pleasing to note that they did not in any degree affect either the birds or their productiveness. The following competitors have had cases of broodiness:—W. Smith (2), A. E. Walters (2), H. Puff (2), W. H. Reilly (3), W. J. Mee (1). There are still a few stray cases of moult. The health of the birds has been excellent. The following are the individual records:—

Competitors.	Breed.	May.	Total.
LIGHT BREEDS.			
*Dixie Egg Plant	White Leghorns	154	293
*Mrs. L. Henderson	Do.	122	236
*E. Chester	Do.	136	231
*G. Prince	Do.	140	230
*G. W. Hindes	Do.	141	226
*C. P. Buchanan	Do.	138	224
*C. Knoblauch	Do.	130	223
*T. Fanning	Do.	119	223
H. Fraser	Do.	116	219
*O.K. Poultry Yards	Do.	124	216
*G. Howard	Do.	136	212
B. Caswell	Do.	108	209
*W. Becker	Do.	116	207
*Dr. E. C. Jennings	Do.	109	204
*Range Poultry Farm	Do.	102	201
*Oakland Poultry Farm	Do.	126	193
*G. H. Turner	Do.	118	192
*W. Lyell	Do.	127	191
*L. G. Innes	Do.	91	186
J. J. Davies	Do.	114	181
G. W. Williams	Do.	99	181
O. W. J. Whitman	Do.	109	180
*T. Taylor	Do.	107	177
*Quinn's Post Poultry Farm	Do.	100	162
*R. Holmes	Do.	124	160
Progressive Poultry Pens	Do.	56	160
*C. Porter	Do.	88	159
*J. Zahl	Do.	106	158
*E. A. Smith	Do.	96	156
Mrs. A. G. Kurth	Do.	94	144
G. Trapp	Do.	90	142
S. Wilkinson	Do.	62	142
*T. B. Hawkins	Do.	78	139
*Mrs. A. T. Coomber	Do.	76	139
H. F. Britten	Do.	75	139
R. T. G. Carey	Do.	96	137
*J. W. Newton	Do.	72	134
Mrs. J. F. Anderson	Do.	64	133

EGG-LAYING COMPETITION—*continued.*

Competitors.				Breed.	Map.	Total.
LIGHT BREEDS— <i>continued.</i>						
*J. M. Manson	...	...	...	White Leghorns	83	123
*Himalayan Poultry Farm	...	...	...	Do.	63	112
H. B. Stephens	...	...	...	Do.	65	109
Shaw and Stevenson	...	...	...	Black Leghorns	92	100
*Mrs. R. Hunter	...	...	...	White Leghorns	69	89
P. O. Oldham	...	...	...	Do.	49	83
A. W. Walker	...	...	...	Do.	55	68
W. A. Wilson	...	...	...	Do.	48	51
B. Chester	...	...	...	Do.	8	45
HEAVY BREEDS.						
*Nobby Poultry Farm	...	...	...	Black Orpingtons	154	243
T. Hindley	...	...	...	Do.	132	199
*W. H. Reilly	...	...	...	Chinese Langshans	103	198
*W. Smith	...	...	...	Black Orpingtons	75	180
*A. E. Walters	...	...	...	Do.	87	179
*E. F. Dennis	...	...	...	Do.	101	152
W. J. Mee	...	...	...	Do.	99	150
*E. Morris	...	...	...	Do.	87	135
E. M. Larsen	...	...	...	Do.	107	131
*J. W. Macrae	...	...	...	Do.	32	122
*Mars Poultry Farm	...	...	...	Do.	90	102
H. Puff	...	...	...	Rhode Island Reds	31	80
*R. Burns	...	...	...	Black Orpingtons	67	77
*D. Fulton	...	...	...	Do.	28	63
Th. W. Lutze	...	...	...	Do.	43	43
A. Shanks	...	...	...	Do.	42	42
*F. A. Claussen	...	...	...	Rhode Island Reds	38	38
J. Fitzpatrick	...	...	...	Do.	22	26
Totals					5,979	9,979

* Indicates that the pen is engaged in single hen test.

RESULTS OF SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant ...	45	48	53	44	50	53	293
Mrs. L. Henderson	44	42	38	20	45	47	236
E. Chester ...	28	44	35	46	47	31	231
Geo. Prince ...	20	41	43	45	41	40	230
G. W. Hindes ...	53	43	37	40	30	23	226
C. P. Buchanan ...	39	28	40	31	46	40	224
T. Fanning ..	39	41	42	19	43	39	223
C. Knoblauch ...	33	28	44	33	43	42	223
O.K. Poultry Yards	41	39	40	27	38	31	216
Geo. Howard ...	32	32	41	31	35	41	212
W. Becker ...	34	34	26	41	31	41	207
Dr. Jennings ...	27	41	41	40	38	17	204
Range Poultry Farm	22	44	25	39	31	40	201
Oakland Poultry Farm	30	33	41	37	24	28	193
G. H. Turner ...	5	27	40	37	47	36	192
W. Lyell ...	40	39	38	31	23	20	191
L. G. Innes ...	19	45	46	27	10	39	186

RESULTS OF SINGLE HEN PENS—*continued*.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
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LIGHT BREEDS—*continued*.

Thos. Taylor	22	38	38	18	27	34	177
Quinn's Post Poultry Farm ...	40	27	18	25	39	13	162
R. Holmes	42	30	18	21	21	28	160
C. Porter	0	31	30	26	35	37	159
J. Zahl	35	29	25	30	25	14	158
E. A. Smith	4	44	30	42	34	2	156
T. B. Hawkins	30	18	36	8	34	13	139
Mrs. A. T. Coomber	10	33	23	24	10	39	139
J. W. Newton	28	37	1	17	30	21	134
J. M. Manson	41	29	40	1	11	1	123
Homalayan Poultry Farm ...	37	32	8	0	35	0	112
Mrs. R. Hunter	9	30	2	11	15	22	89

HEAVY BREEDS.

Nobby Poultry Farm	48	42	37	30	38	48	243
W. H. Reilly	30	42	37	25	26	38	198
W. Smith	43	35	18	19	31	34	180
A. E. Walters	30	41	25	33	43	7	179
E. F. Dennis	43	18	20	0	45	26	152
E. Morris	6	38	40	37	14	0	135
J. W. Macrae	0	0	39	12	34	37	122
Mars Poultry Farm	9	23	32	16	11	11	102
R. Burns	10	7	0	1	37	22	77
D. Fulton	3	3	4	2	1	50	63
F. A. Claussen	10	7	0	4	17	0	38

DUCKS AND THEIR MANAGEMENT.

By J. BEARD, Poultry Instructor.

There are many varieties of domestic ducks, amongst which, the best known are the Aylesbury, Pekin, Rouen, Blue and Buff Orpington, Indian Runner, and Muscovy. Generally speaking, ducks are hardier and more easily reared than fowls. They are comparatively free from disease, and seldom troubled with insects. They stand confinement well, especially the heavier breeds, and for this reason alone duck-rearing might be taken up on a much larger scale in Queensland than is the case at present.

In most countries the breeding of ducks ranks on an equality with any other branch of poultry-keeping. In America there are some very large duck farms which produce many thousands of ducks that are sent away in carloads to the central markets.

The Indian Runner is the smallest of the duck family, and is not a desirable duck for market, but, on the other hand, it is one of the most profitable egg-producing ducks that we have in Queensland and can be depended upon for its excellent laying qualities. There are three varieties of the Indian Runner duck—fawn and white, white, and black, the first named being the most popular at present. The white variety, so far, does not find many admirers and is seldom seen on the show benches. The blacks, so far as I know, have not made their appearance in Queensland.

Indian Runners are hardy, easily reared, and are grand foragers. They do well with little swimming water. For the size of the bird, the egg is remarkably large, of good shape, and mild in flavour.

The standard weight for drakes is 4½ lb. and for ducks, 4 lb. The weight in either sex should not exceed 5½ lb., nor be less than 3½ lb.

The Aylesbury is the premier table breed in England, and is of European origin, generally believed to have originated in England. The plumage of the Aylesbury is white, and does not show so much of a yellowish tinge as that of the Pekin. The Aylesbury matures very quickly, faster than any other breed; and ducklings, if properly fed, should weigh 5 lb. to 6 lb. at ten weeks. In the Aylesbury district in England, where this breed is largely kept to supply the London market, one does not find the somewhat exaggerated type familiar in the show pen. The bird, as bred there, is more upright in carriage than the exhibition type, with little or no keel. They weigh considerably less, too, and are consequently more active. Some strains of the Aylesbury lay well, but, generally speaking, they are not so prolific as the Indian Runners or Pekins. Their eggs are of fair size, and vary in colour from white to green. The Aylesbury and Pekin make a very good cross for table purposes.

The standard weights are:—Drake 10 lb., duck 9 lb., although exhibition specimens often scale more. The colour should be pure white with dark eyes, pink-white bill, legs and feet bright orange. The carriage should be horizontal with the keel (*i.e.*, the vertical part of the breast bone and the dependent flesh and skin below it), practically parallel with the ground.

The Pekin duck, which owes its origin to China, has been greatly improved in size and quality since its introduction to other countries. Although they mature somewhat more slowly than the Aylesbury for the table, they are more active, better layers, and less liable to leg weakness, owing to the fact that their carriage is more natural. There are not many breeders who go in for the pure-bred in Queensland. In fact, there is not much demand for the pure-bred in Australia, except for show purposes. Most specimens contain a touch of the Aylesbury, and the cross seems to have taken on better with breeders. The standard weights are:—Drake 9 lb., duck 8 lb. The colour is a deep cream; eyes, dark lead-blue; feet and legs, bright orange; bill, orange and free from black marks. In carriage they are almost upright, though not so erect as the Indian Runner. There should be no keel, except just between the legs, where it shows very slightly. The breast should be broad and full, the paunch and stern, deep and broad, and carried just clear of the ground. The Pekin is a non-sitter, though some strains will give slight evidence of the maternal instinct.

The Rouen is undoubtedly the most beautiful of all our domesticated breeds of ducks and is said to originate from Rouen, in France. They resemble in colour the mallard or wild duck, from which they are directly descended. In type and size they are very similar to the Aylesbury, the horizontal carriage and deep keel being much the same in both breeds. They mature very slowly, and are only fair layers, the eggs being somewhat small. They are good roasters, the flesh of the pure kind being dark. Owing to their handsome appearance, they have of late been bred largely for exhibition purposes. In the scale of points given for drakes of a possible 100, no less than 60 are given for colour and markings. The standard weights are:—Drake 10 lb., duck, 9 lb.

The Muscovy duck, originally found in South America, materially differs from other ducks, and is generally considered to be a distinct species of duck, and not a descendant of the wild mallard. This duck is making great headway in Queensland, and owing to the great demand of the breed for table purposes it commands a ready sale at all times, being a quick grower, it is ready for the table at fourteen weeks. The Muscovy is a perfect sitter, covering from 15 to 20 eggs, according to size. If she is provided with comfortable warm quarters she will mother 50 ducklings at a time. The Muscovy is of a very hardy nature, and prefers to select its own nest in a secluded place, and hatch her own eggs. I would advise inexperienced hands not to try and hatch the eggs in incubators as failure would be sure to follow. Splendid table birds can be obtained by crossing the Muscovy with either the Aylesbury, Pekin, or Rouen. This cross, being mules, is non-productive.

HOUSING.

The housing of ducks is a simple matter. A low lean-to shed, 4 ft. high in front and 3 ft. high at the back, will answer the purpose well. The back and ends should be boarded, and the front to face north or north-east, and covered with wire netting, so that the morning sun can get inside. Ducks must have plenty of fresh air. The floor must be well raised above the surrounding ground and should be hard and dry. This is very important, as young ducks are subject to rheumatism. A wooden floor should on no account be used, as it not only becomes quickly tainted, but remains damp for a long time when once wet, and always makes a safe harbourage for insects and vermin generally. Plenty of clean bedding should be supplied—twice weekly at least. Bush hay or mill chips should be used, if available.

In the breeding season, the ducks should be kept in the house, or, at any rate, away from their swimming water until 10 a.m., as many will lay in the water, and the eggs become spoilt or lost. A good plan is to wire off part of the run next to the house, and supply the birds with drinking water only, until they have laid.

A breeding pen generally contains one drake and four or five ducks. If one has unlimited space and water, and the aim of the duck farmer is only to raise ducklings for the market, ten or twelve ducks and three drakes may be run together. The male birds soon settle down, and seldom interfere with each other.

I would not advise mating young stock birds under twelve months old. A vigorous drake about twelve months old, mated to two-year-old ducks, as a rule, gives good results. One must have maturity on one side or the other. It is very important that males and females should not be related in any way, if hardy, vigorous youngsters are required.

The first two batches of eggs laid in the season are generally unfertile, and care should be taken by those selling sittings to test all eggs for a week or more by putting a few into the incubator or under a broody hen before sending them out to customers. Duck eggs, as a rule, travel badly, and great care must be taken in packing them securely.

SHADE AND SHELTER

from the hot sun and cold winds are very necessary, as young ducks are unable to stand the hot sun on their heads for long, their skulls being very thin. Shelter from the cold winds should also be provided. The best kind of shelter is natural shelter, therefore all trees or bush should be left in the pens when possible. Some people make a great mistake by clearing all natural trees from the yards and then have to build artificial shelter afterwards.

The most convenient fence for a duck-yard is 2 ft. netting. While this will keep the ducks within bounds, it is convenient for the attendant to step over from one yard to another without having to go round to the entrance. Muscovys, of course, would require something higher, but 4 ft. would answer the purpose.

FEEDING.

Mash should be fed to ducks in troughs. It should never be thrown on the ground. In this way, there is no waste, and the runs do not become tainted with sour food. Mash for ducks should be mixed more moist than that for other kinds of poultry. For breeding ducks the following is recommended:—Two parts bran, 1 part pollard, 25 per cent. of cooked vegetables or green lucerne chaff scalded, to which should be added 10 per cent. of meat or dried blood.

It is very important that ducks should be supplied with meat. When at liberty, they pick up a lot of insect and animal life on the banks of creeks and swamps, such as slugs, frogs, &c., so if good results are required, this must be attended to. The meat can be cooked overnight, and, together with the soup, mixed in with the mash. All grain should be fed to ducks under a few inches of water. It is the most natural, and, consequently, the easiest way for them to pick it up. A half kerosene tin answers very well for the purpose. Grit should be given to them in the same manner. It is most important that ducks should be well supplied with the latter.

Ducks in the breeding pen must not be allowed to get too fat, otherwise the fertility of the eggs will suffer. Ducks are large eaters and put on condition quickly. Do not leave food before them all day long. Remove the trough after they appear satisfied. Green feed, such as chopped lettuce or green lucerne, can be given to them daily at noon; the latter should be scalded and dried off with a little bran.

Changes of food should be made gradually, especially when the ducks are in full lay. Lessening the quantity of meat will quickly cause a great falling off in the egg yield. Of the various grains, small hard wheat is one of the best. Short, plump oats are also excellent. Maize must be fed with discretion to the breeding stock, especially during hot weather. This grain is too fattening, and a laying duck should be in hard condition.

Fertility is always much better when a fair amount of water is available—not necessarily deep water. More especially is water necessary for breeding pens of the heavy varieties. Young ducks being raised for the market do not require swimming water, although a swim once or twice weekly will not do them any harm.

INCUBATION.

During the period of incubation, which is twenty-eight days, duck eggs require more moisture than do the eggs of hens or turkeys. From the sixth day, after the eggs have cooled and aired, and just before closing the drawer of the incubator, they

should be well sprinkled with tepid water. For duck eggs, the incubator should be run at a slightly lower temperature than for fowls, 102 to 102½ degrees giving the best results. Owing to the transparency of the shell, a duck egg can be tested on the fifth or sixth day. A second test should be made on the thirteenth or fourteenth day, and all doubtful eggs removed from the drawer. An addled duck egg gives off a powerful odour, which is most harmful to the remaining eggs in the incubator. The bad eggs are easily detected, as the transparent shell quickly becomes discoloured.

From the time the egg chips, the duckling takes a long time to get out of the shell. After the egg is chipped, all that requires to be done is to place the egg with the chipped part uppermost. It should then be left for about 30 hours. If not then hatched, a little of the shell may be broken round the large end. If any bleeding occurs, however small, one may be certain that the duckling is not ready to make its way out of the shell and should remain a little longer.

Duck eggs intended for incubation should not be kept longer than ten days. It should be remembered that the fresher the egg the stronger the germ. This applies to all eggs.

REARING AND FEEDING DUCKLINGS.

Young ducks require very little brooding after the first week. A warm box lined with hay or straw will answer the purpose. Care must be taken to allow plenty of ventilation. No food is required for the first 30 hours after hatching. From that time onward food should be supplied little and often. With the first feed, water should be given, and then it should always be before them. A small flat fish tin is the best. Young ducks are easily chilled, especially if their backs get wet.

A small board well sanded should be put down for them, and their soft food, which should be fairly moist, put on it, just sufficient at a time for them to readily clean up. Food should on no account be left lying about. It quickly turns sour, and does a great deal of harm to the young ducks. Boiled rice, oatmeal, pollard, stale bread soaked with milk, and a small quantity of maize meal mixed makes a grand feed for them. After the first fourteen days a little cooked meat may be added. Chaffed lucerne, lettuce, or raw onion can be added with advantage to the above mixture.

After three weeks, if the ducklings are well grown, a little grain can be given, put in a shallow dish, and covered with water. Fine grit should always be before them in the same way, and fine charcoal, given dry, should always be at hand for them.

Young ducks are very easily knocked over by the hot sun, and, consequently, they must be well shaded, especially during the first month. This is a very important point in rearing ducks. Care must also be taken that they are not allowed out in heavy rains.

If the ducklings are being reared for stock birds, they should be allowed plenty of liberty, and naturally not so much food should be given as to those required for the table.

THE MUSCOVY DUCK.

THE GOLD MINE OF THE POULTRY BUSINESS.

By R. G. T. CAREY, Beerwah.

Originally the Muscovy duck—a wild South American duck—was caught and domesticated, and by careful breeding these ducks have been mated up to a very fine standard of perfection.

Their natural colour was black and white, or blue-black and dirty white, but fanciers have created two distinct colours—white or black. The snowy white variety is, however, much more admired for its beautiful white plumage, scarlet face, and pale orange coloured legs, and these are much more acceptable for market purposes on that account. Their flesh is of fine flavour, and in greater proportion on their breast bones than in any others of the duck family, and when in their prime they often turn the scales at 12-14 lb.

The Muscovies are noiseless, very docile, good layers, and as sitters, hatchers, and mothers are excellent. Incubators cannot equal their results as hatchers. They choose and make their own nest, lay, sit and hatch, and owners have absolutely no worry. Being small eaters, upon a free range they can practically feed themselves. That is another point greatly in their favour. Their food consists of over half greenstuff—grass, weeds, roots, and other herbage. Therefore, two meals per day and free range make them mature quickly. They commence to lay at between 5 and 6 months old, and generally desire to sit after laying from 20 to 30 eggs. Furthermore, Muscovy ducks, from birth onward, are extremely hardy and seldom ail.

The ducklings are of strong constitution from the shell. They agree very well among themselves, therefore a whole flock can be allowed to range together. Wherever Muscovy ducks are kept, they never cause any annoyance to neighbours, are never alarmed or timid, and it is practically impossible to frighten them. As travellers they make the best, sitting in their coops as contentedly as if in their own pen.

The rapidity with which this variety has leaped into favour is marvellous, and being marketable at an early age they command a high value. Hotels, restaurant and boarding-house proprietors favour them because of the high qualities of meat they possess.

They keep far easier than fowls in condition, and are always plump. There is no special season for hatching them, and the ducklings are exceptionally strong at all times, continuing so right merrily along, growing and fattening rapidly on any good food.

Duck farmers starting in a small way have three methods of making a beginning. First, hatching with incubators; second, using Muscovy ducks as hatchers and mothers; third, buying day- or week-old ducklings from some reliable breeder, whose plant is prepared for this purpose. We highly recommend the latter plan as being the most reliable for beginners.

Should Muscovy ducks be used, you will require to purchase a pen of birds, and use their eggs, or buy a setting from some reliable breeder. They are generally dispatched promptly in the season, and should arrive in good condition.

Should you decide to obtain ducklings, you will require a brooder for rearing them up to three weeks old. All young birds must have the correct food to maintain and replace waste tissue, also to enable them to create flesh, bone, feathers, and increase in size.

Always feed at regular times, laying stocks as well as breeders, giving a small mid-day meal in cold weather. Should your birds increase in fat, do not decrease the quantity of food given, but add a greater bulk of greenstuff.

Remove all foods from troughs after twenty minutes to half an hour, so that no sour food remains. If birds are confined in a limited space they are likely to go off their food, consequently the egg yield suffers.

As this class of water fowl is easily kept, reared, and quickly sold, a huge profit is assured for an enthusiast in duck farming. The writer has prepared a beautiful catalogue for everyone who desires to enter into Muscovy raising. The book may be obtained free of charge.

QUEENSLAND CITRUS IN MELBOURNE.

A leading Melbourne fruit merchant directs attention to the packing methods adopted by Queensland citrus growers, and emphasises the advantages of the "rowed in" pack against the Florodora pack. The chief advantage of the former is from the standpoint of selling. Buyers desire to know the number of fruits in the cases, because they rapidly calculate at how much per dozen the fruits will sell retail; and thus, by knowing how many dozen fruits are in the case, they know the margin at which they can operate.

With the "rowed in" pack there is an even appearance; with the Florodora (diagonal) pack each second fruit is not visible from the outside. Buyers in operating ask for the "11 doz.," "13 doz.," or "16 doz.," cases. The "13 doz." case has, on each side of the partition, 80 fruits—two outside rows with 30 fruits (6 x 5), and one centre row with 20 fruits (4 x 5)—or a total of 160 fruits to the case = 13 1-3rd dozen. The "16 dozen" case has 97 fruits on each side of the partition, thus: two outside rows each 6 x 6 = 72; one centre row 5 x 5 = 25; or a total of 194 fruits, or 16 1-6th dozen.

Buyers, on seeing the neat rows and knowing number of fruits in the case and the size of the fruits, purchase without any uncertainty.

Incidentally (though this is quite apart from the present point) it illustrates the advantages of selling all fruits by number instead of by weight—reducing the elements of uncertainty, to the mutual benefit of grower, wholesaler, and retailer. —"Fruit World."

The Orchard.

UTILISATION OF LOW-GRADE ORANGES.

In all orange-growing countries, a considerable quantity of fruit of poor quality, when sent to market, gives such small returns as to entail a loss to the grower. In the United States of America, the Federal Department of Agriculture has opened up a new use for waste fruit other than the making of jellies, marmalade, &c. This is the production of sweet-orange oil. Until recently this product was secured wholly from Italy, Sicily, and other parts of Southern Europe. From the "Journal of the Jamaica Agricultural Society," we learn that since 1911 a considerable industry has grown up in the West Indies, and a portion of the annual requirements in the United States is now supplied from that region. In 1914 more than 222,000 dollars (£44,400) worth of sweet-orange oil was imported. "With the increasing tendency to grade fruit more closely, and to better market conditions, the proportion of culls will doubtless increase rather than decrease," say the Federal investigators. "At present, this low-grade fruit, packed in so-called 'plain wraps,' is sometimes shipped to near-by markets for immediate consumption. The returns are exceedingly small, especially in years when the crop is abundant. At the present time there is, without doubt, enough low-grade fruit available to make possible the extraction of a quantity of orange oil sufficient to supply a considerable portion of the domestic demand.

In order to facilitate their experiments, the Federal workers have perfected a new machine for peeling citrus fruits—one that can be adjusted to handle all sizes from grape-fruit to limes. This machine has been given a public-service patent and dedicated to the public. The investigators found that pressing out the oil, and later, refining it by a simple process, was the method best suited to all conditions involved. The press is inexpensive, and can be made by any mechanic; the still is simple, inexpensive, and can be purchased from many dealers in pharmaceutical and chemical supplies.

Full directions for extracting and refining the oil cannot be given in limited space, but can be obtained by writing to the Federal Department of Agriculture, Office of Drug-Plant and Poisonous-Plant Investigations, Washington, District of Columbia.

After the plant is equipped the cost of producing the oil will depend entirely upon the price paid for waste fruit and the cost of labour. In the experimental work the cost was about 15 cents. for extracting the oil from a standard field box of oranges of approximately 100 lb., and it is believed that on a commercial scale the cost will be no greater for fruit delivered at the factory door.

In commercial experiments with cull fruit obtained at the packing-houses at Orlando, Florida, the average yield of oil per 100 lb. of fruit was about 5 oz. At the average price paid for orange oil during the past ten years the gross returns would be from 47 to 59 cents per field box. The gross return, as determined from actual sales in the markets, of the oil produced in the experimental work was 54 cents per field box.

The cost of extracting the oil from 100 lb. of cull fruit is estimated to be about 15 cents, and the net returns would be from 32 to 44 cents per standard field box, assuming that the fruit is delivered at the factory door.

REJUVENATING OLD FRUIT TREES.

There are numbers of orchards in which the trees have been allowed to run out and become comparatively unproductive. This has usually occurred owing to growers allowing the trees to draw too much on the sap for the development of the top branches. These trees, for the most part, are barren of laterals along the greater length of the leaders, while the top part of the tree resembles the inverted head of a straw broom more than anything else. This dense head has in the course of a few years starved out any laterals that may have been produced. Nevertheless, the great majority of these trees may be brought back by cutting to a state of usefulness in

the course of a season or two. This may be done by putting pressure on the dormant buds along the main arms, and so causing them to break out into new growth. By cutting these branches hard back to points at which considerably smaller branches form perpendicular laterals, the sap flow finds itself jammed back, the lighter growth not being able to accommodate it, with the result that this pressure is placed upon the dormant buds, thus causing them to break and in time form new laterals.

No fruit tree is more amenable to this form of treatment than the peach, and it is surprising how quickly an old tree can be refurnished with a suitable class of fruiting wood by merely cutting back the leaders hard, so as to conduct the sap flow into a new and smaller channel. Trees twenty and thirty years of age have been brought back to productiveness in this manner, but when this is accomplished care must be taken that the faults which rendered this course necessary should not be repeated.

THE ALGAROBA TREE.

We have frequent inquiries from correspondents concerning the value of the Algaroba tree, especially as to the food value of the beans it produces for stock, and several articles have appeared in this Journal on the subject. From a Hawaiian source we take the following interesting article on this valuable tree, entitled

“THE ALGAROBA TREE.

“A TREE AUSTRALIA WANTS.

“Although the algaroba, or keawe, is not a native of Hawaii—it was introduced to the islands by Father Bachelot, a French missionary, in 1828—the Hawaiian territory can claim the credit of having discovered the many extraordinary merits of this remarkable tree and of having turned its cultivation for the first time in history to the uses of man. No one knows precisely from what country the algaroba originally came. Little more, indeed, is known of its early history than that a fine ornamental specimen flourished in the Jardin du Roi de Paris in the first quarter of the nineteenth century; and it was from this very tree that Father Bachelot brought the seed which he planted beside the Catholic Cathedral at Honolulu in 1828. Of all the seeds the French missionary planted only one germinated. It rapidly developed into a fine tree, and within a few years it overtopped the cathedral, and covered all the mission buildings with its grateful shade.

“For some decades not a living soul suspected the great part this tree was destined to play in the industrial development of the Hawaiian Islands; and no attempt was made to investigate its habits or to solve the mystery of its rapid spread until algaroba forests actually threatened to displace the indigenous island growths. It was then noted by a local botanist that cattle had been the active instruments of this astonishing phenomenon. Admitted to the mission grounds, they had eaten the beans lying under the famous cathedral tree and carried the seeds up the barren hillsides of extinct craters, to be deposited in crevasses and on elevated coral beds. In these places the seeds, dropped by the mission cattle, had established thick groves of algaroba, covering the once bare lava hillsides with a thick mantle of evergreen, to act as fresh centres of wider distribution through the agency of new generations of live stock.

“Carrying his researches a little further, the botanist discovered that the seed of the algaroba is surrounded with a hard casing like that of a shark’s egg, which prevents the seed from being digested by cattle feeding on the bean, and thus ensures its chance of germination when rejected in the cattle excrement in some favouring locality. The first mystery having been solved, later investigators undertook the task of determining the reason of the emphatic predilection exhibited by all sorts of live stock for the bean. The pod was subjected to chemical analysis and the secret was forthwith laid bare. It was found that the bean contains a lot of sugar and a rich proportion of protein, thus rendering it not merely a palatable, but a highly valuable, fodder for all kinds of farm stock. When this discovery was made known the cultivation of the algaroba was no longer left to the unaided and unconscious efforts of the Hawaiian cattle.

“Many settlers were prompt to plant algaroba forests on their ranches and holdings, and the success they met with started a movement which has ever since proceeded uninterruptedly, until at the present time the Hawaiian Islands afford the spectacle of an almost uniform forest covering. The supreme peculiarity of the algaroba is that it is essentially a desert growth. It flourishes best where the soil is poor, the elevation fairly low, and where the rainfall is scanty. These conditions very frequently prevail in the Hawaiian Islands—hence the remarkable spread and

cultivation of this singular tree, which in the course of a generation has converted **most of the bleakest** Hawaiian deserts into the most valuable land in the territory. The algaroba, however, would never have attained to its full use as a friend of man without the further aid of science.

"The collection and storage of algaroba beans for cattle food had long been an industry of respectable dimensions, when one day (only a few years ago) it occurred to a local chemist to discover if any food values resided in the seed which cattle ate with the pod, but did not digest, for the reasons already stated. The result of his experiments was a convincing demonstration that the seeds hold far more protein than the pod itself. Inventors at once set to work to construct a macerator that would break the seed within the pod, and it was the good fortune of Mr. C. W. Rennear, of Honolulu, to outstrip his competitors and to produce the ideally requisite machine. The effect of this invention was to revolutionise old methods and to turn a comparatively limited activity into a great national industry.

To cite a single apposite illustration there is the case of Molokai. On this island there is a grove of algaroba trees covering 8,300 acres. Before the algaroba was planted there the land was utterly valueless—a piece of bare and uninhabitable desert. The algaroba grove enabled it to support a thriving herd of cattle. The invention of the Rennear machine caused the cattle to be dispensed with and the former desert to become one of the most valuable bits of land in the world. These 8,300 acres produce annually 166,000 tons of beans, which are gathered at a cost of £1 per ton, and have a net sale value after maceration of almost £4 per ton, showing a bulk profit of approximately £600,000 a year.

"The Hawaiian Islands are already exporting large quantities of macerated algaroba beans to North and South America and Asia; some is coming to Australia; and they were beginning also to develop markets in Europe when the war broke out. The value of the algaroba as a fodder tree may be defined in a few words. It bears abundantly within two or three years from the seed, and it can produce a net revenue of £80 an acre from land that is totally and absolutely unfit for any other sort of crop. Surely Australia needs this tree; and as it can be grown with ease in almost every part of Australia from Cape York to the Leeuwin, and is capable of almost immediately transforming our vast desert spaces into profitable cattle pasturages, it is clear that we should lose no time in getting it and making it our own. We have freely given our eucalyptus to all the world; it is a fair thing to acquire the algaroba in exchange.

"But the algaroba is not only useful as a fodder tree. The Americans do not call it the 'most valuable tree in the world' merely because of its fodder uses, but because there is no other tree known to science which is useful for a greater variety of applied human purposes. The flowers of the algaroba tree furnish the most important source of pure honey known in Hawaii—famous throughout the world as 'the Islands of Flowers.'

"The production of honey is a great and growing industry in the territory. It all comes from the algaroba tree, which flowers twice a year and produces two crops of beans annually. Formerly the bee raisers of Hawaii got their bee-ranging rights over the algaroba groves for nothing, but they now have to pay heavily for the exclusive privilege of placing their apiaries in the various forest groves—thus giving the algaroba planter a brand new source of revenue.

"Algaroba wood constitutes, also, the chief source of fuel in the territory. Its growth is so rapid that planters find it highly profitable to thin out all the larger trees at least once a year for sale as fuel, thus continuously making space for the growth of new generations of trees. The wood burns slowly with a strong and steady glow, and it has a calorific value so high that it can be used in factory furnaces in place of coal or coke. The smaller branches make an excellent charcoal.

"As the algaroba is a legume and has a remarkable soil-penetrating power, it is a soil maker of first rate importance.

"The bark of the algaroba contains a large proportion of tannin, and is finding a large use in the leather industry.

"The gum of the algaroba provides a profitable use in the manufacture of varnish.

"The pods of the algaroba are largely and increasingly used in the manufacture of vinegar and denatured alcohol because of their high sugar content.

"The boles of the algaroba tree make excellent piles for use in all coastal waters, both by reason of their toughness and durability and because they are practically immune from the attack of the Toredoworm.

"Finally, the algaroba has a high artistic value as an ornamental growth and as a shade tree, for its form is extremely graceful and spreading, and its foliage is both delicate and beautiful."

Viticulture.

PRACTICAL HINTS IN ESTABLISHING A VINEYARD.—No. 2.

By P. MAHONEY.

PLANTING.

If the land has been duly prepared, the next important thing to consider is

THE SELECTION OF PLANTS.

If the land is of a heavy nature, rooted plants are the best, but cuttings are better than rooted plants in sandy soil. Plants that have been rooted in heavy soil have a decided advantage over those rooted in sandy or light soil, for they generally have more fibrous roots than the latter, which is most essential to plants which have to be transplanted. Plants rooted in sandy soil have a tendency to produce long roots devoid of many serviceable fibrous roots, simply because they can travel further than when in heavy soils.

In planting rooted vines, they require a systematic pruning, which consists in cutting off all fractured roots and making clean cuts of those intended to remain. It is advisable not to have too many strong roots, for some may die back to the detriment of the plant. Clip the points of the fibrous roots, for they might have been badly broken in uprooting. Secondary and lateral roots should never be allowed to cross one another. The top of the plant to be pruned to two buds and a base bud. In coastal districts it is beneficial to make all cuts through a node, for the reason that cutting through the internode exposes the pith, which through excessive moisture, rain or otherwise, decomposes, to the detriment of the bud below.

Roots should only be allowed to grow from the two bottom-most joints of the plant. In the event of the land being prepared, as previously described, it is not necessary to dig holes for the plant until the planting is taking place. When planting, all roots should be spread out and spaced, not permitting too many to go in the same direction. Care should be exercised in seeing that the points of the roots do not curl up, for it is very important that they should be directed downwards, so as to bring them into early contact with the subsoil, which is far richer than the surface soils.

If any fertiliser is given, it should be dug in deeply, so as to encourage the roots to go down. It is a good plan to sow slow-acting manure in the subsoiled furrow where the plant is to go before the furrow is filled in.

Roots are unlike the top of the plant, in that the top can be renovated or re-established at any time. But the roots have to receive their one and only training during the first year or two. Root training is more important than the training of the top of the plant, for it is through

the former that the plant gets its food, and unless the root system is well established the quantity of foodstuff cannot be supplied to the plant and crop, and the plant will, in consequence, never be very profitable.

In the event of cuttings being planted in preference to rooted plants, great care should be exercised in selecting and making them. They should be off thoroughly matured wood, and be made directly after the vines have been pruned. Never should cuttings be got from prunings that have been subjected to frost, for they very often fail to shoot, the frost having deprived them of a considerable amount of sap.

The cuttings should be about 9 or 10 in. long, and should contain a non-pithy septum at the bottom. That is: The cutting is cut off a rod, leaving a section of it on the cutting, thus not exposing the pithy portion, which prevents decomposition and offers no encouragement to white ants.

Cuttings should be short-jointed and consist of no more than five buds, exclusive of the node, which should be cut through to prevent decomposition.

In planting, two cuttings should be planted at the one place, so as to avoid any likely misses. They should be planted far enough apart so that one can be removed without disturbing the other in the event of both striking. Six inches apart is far enough.

A sharp, narrow spade is the best implement to use. It is more satisfactory than a crowbar, which is widely advocated. With a crowbar, very often the soil fails to come in contact with the bottom of the cutting, for it is difficult to press the soil down heavily enough so as to fill in the hole at the bottom, thus leaving air around the bottom of the cutting, which will certainly fail to send out roots from the bottom buds if those conditions prevail. A heavy rain would probably right things. But it might be some time before rain arrived, consequently the roots from the buds near the surface would be the only source of support, thus making the vine a shallow rooter, which should be avoided by using a spade instead of a bar.

The spade has many advantages over the bar; "it's quicker and surer."

To use the spade, it is only necessary to insert it at the required place, push it forward, then insert the cutting at the back, withdraw the spade, and one press of the foot is enough to consolidate the soil around the cutting. They do just as well when planted straight as they do when on the slant. It is not advisable to have the cutting too far out of the ground, for it exposes it too much to the winds and sun, especially if the cutting is slow in making a start, when it is likely to have a big portion of the sap evaporated through exposure. It is not necessary to have the top bud any higher than half an inch above the soil.

To some, all this may seem unnecessary work and useless expense, but it is to be borne in mind that a well-planted vineyard is good for more than one generation, so that it pays to do the thing thoroughly.

(TO BE CONTINUED.)

Tropical Industries.

ARROWROOT—ITS CULTIVATION AND MANUFACTURE.

BY THE EDITOR.

Although several papers on arrowroot-growing and on the manufacture of the commercial starch have from time to time been published in the earlier issues of the "Queensland Agricultural Journal," yet, as the present-day subscribers are unable to obtain copies of those journals owing to their being out of print, it is deemed advisable to collate all available information on the industry and present it in pamphlet form to intending arrowroot-growers, from many of whom inquiry is being frequently made as to the prospects of the industry in Queensland.

It is now over fifty years since the industry was first established by the late Mr. George Grimes at Oxley Creek, where he erected the first machinery for manufacturing arrowroot on a commercial scale. As soon as this took place, the writer, who had been growing arrowroot in the same district and manufactured it with most primitive appliances, as will be shown later on, entered more largely into the business of cultivating the plant, and abandoned the manufacture in favour of supplying Mr. Grimes's mill with the raw material, to their mutual benefit.

The bulbs were sold at £2 10s. per ton, and on the then virgin scrub soils between Oxley Creek and Rocklea (then known as the Rocky Water-holes), and on the Brisbane River, the yield was enormous. Two varieties were grown at that period—the Bermuda or *Maranta arundinacea*; and the large purple variety, *Canna edulis*, called in the West Indies "Tousles-mois." These differ materially from each other both in habit of growth and in size, shape, and colour of the bulbs.

The Bermuda plant is diminutive, rarely attaining a greater height than from 3 to 4 ft. The blossom is white, and the tubers, which cluster round the roots, are also white, with a thin shiny skin and bare of rootlets. They adhere to the roots of the plants much in the same manner as potatoes, and are neither very large nor numerous. The starch yielded by the *Maranta* is of excellent quality, and usually commands a higher price in the English market than that of *Canna edulis*. How little actual difference there is between the products of the two varieties is indicated by the following analysis, taking the best Bermuda arrowroot at 2s. per lb. and the Queensland arrowroot (*Canna edulis*) at 3d. per lb.:—

		Bermuda Arrowroot.		Queensland Arrowroot.
Moisture	.. ..	13.00 to 16.50	..	17.36
Starch	.. ..	82.24	..	81.52
Ash	.. ..	.124	..	.142
Proteids	.. ..	.052	..	.078
Fibre	.. ..	4.09 to 1.20	..	.90

The result is, therefore, chemically, about the same, particularly in regard to starch, which is the chief constituent. There is a little more moisture in the Canna, and more fibre in the Maranta. Under the microscope, the Canna arrowroot shows a more silky texture, and the grains are slightly coarser.

The reason why Maranta has never become popular in this State is that it does not yield one-quarter the weight of bulbs, nor is the starch content equal to that of Maranta grown elsewhere, besides which the excess of fibre in this variety makes the matter of treatment more difficult.

A remarkable point about the sale of Queensland, or "Australian Arrowroot," as it is called in England, is that it cannot be sold in Great Britain without some qualifying term attached, such as "Queensland" or "Australian arrowroot." How this has come about is rather interesting. When the Drugs and Food Act was passed by the Imperial Parliament, it was specified that "Arrowroot is the product of the plant *Maranta arundinacea*." That is what Bermuda and Mauritius arrowroots are made from. Manufactured arrowroot from the *Canna edulis* was then practically unknown in Great Britain. I have shown above what little difference there is between the two. It has actually been stated that Queensland arrowroot is an adulterant! Whereas it is generally conceded that, so far from that, it is preferable as a food to the Bermuda product. The purple variety, which is, as said, exclusively cultivated in Queensland, grows to a great height, often rising to 8 ft. or 9 ft. It has very large, broad, ribbed leaves; and as many as 15 to 20 stalks rise from a single stool, each stalk representing a large bulb. In the flowering season the plant sends up a long, straight spike, from the head of which bursts a beautiful bunch of bright scarlet flowers, having the appearance of those of the common Canna known as "Indian Shot," but far larger. The seeds do not often mature, however, as do those of the Canna family generally. The bulbs from which the arrowroot of commerce is prepared form a compact mass on and near the surface of the soil, and so prolific is the plant that I have dug from a single stool as much as 60 lb. and even 80 lb. weight of bulbs.

METHOD OF CULTIVATION—SOIL AND CLIMATE.

It does not follow that because there are, at present, only one or two principal centres of arrowroot manufacture in Queensland, therefore the plant will thrive only in these localities, which are mainly located on the South Coast line, at Pimpama, Coomera, and Ormeau. On the contrary, it grows luxuriantly on all the coast lands—from the Tweed River in the far South to Cooktown in the far North. As to soil, it prefers the rich alluvial scrub lands on river and creek banks, but does very well also on the deep black soils of open country. This refers to the purple variety. The Bermuda plant prefers a more sandy loamy soil, deep, with no clay subsoil. The writer grew both varieties at Oxley on the newly-cleared scrub land bordering that creek, and found that the Maranta (Bermuda) did not thrive well on the rich soil, many plants producing only two or three tubers, 6 or 7 in. long and about 1 in. in diameter. The Purple Canna, on the contrary, grew most luxuriantly, and produced an

enormous quantity of bulbs, which found a ready sale at Mr. Grimes's mill, then located on the Brisbane River.

The climate and rainfall in the districts named were exactly suited to the well-being of the plants, and it is worthy of note that no insect or fungoid pests were ever observable either on leaf, stem, or bulbs. It follows that a deep, rich, well-drained soil and a moderate rainfall are all that is needed to ensure a good crop.



PLATE 6.—FIELD OF ARROWROOT AT PIMPAMA, SIX MONTHS OLD.

The accompanying illustration (Plate 6) represents a well-grown field on the Pimpama River (32 miles from Brisbane), on the property lately belonging to Messrs. Lahey Bros., who had a very extensive manufacturing plant, where cornflour was also prepared.

CULTIVATION.

A visit to some of the arrowroot farms serves to show that there is a similarity among them all, both in preparation of the land, planting, after cultivation, and harvesting.

Where planting takes place in newly burnt-off scrub land, the innumerable stumps, of course, occupy so much of the surface as to preclude any ploughing. It then becomes necessary to dig holes with a sharp mattock or hoe which will cut the roots of the felled trees with which the ground is matted. The rows should be about 6 ft. apart with 4 ft. 6 in. between the holes; but, owing to the presence of stumps, very little regularity can be observed, and the planter must do the best he can as to distances between plants. On open cleared land, where the plough can be used, the proper distances can be observed. The land, in the latter case, should be thoroughly well ploughed, harrowed, and pulverised. Then shallow drills are drawn with the plough about 6 in. deep, and at the regulation distance of 4 ft. 6 in. apart single small bulbs are dropped and covered by turning a furrow over them on each side. On very rich new land, the best results have been obtained by placing the rows 8 ft. apart. As the land becomes poorer, the rows may be closer together, but should not be of a less width than 6 ft. I saw a field lately at Pimpama, on what was once my old sugar plantation (Ormeau), in which the rows were 6 ft. apart, yet in the month of April the plants had spread to such an extent that it was difficult to walk between them.

When the plants are above ground, they must be kept clean as in the case of other crops, and by the time they are about 3 ft. high they will want little further cultivation beyond throwing up a furrow against the roots—hilling up, in fact, as with potatoes. From this time forward, the heavy foliage will soon have covered the ground, thus effectually preventing the growth of weeds.

The planting season extends from August, after the last frosts, to the end of November and even up to January in some late localities. When full grown, a field of Canna presents a very pretty sight, the broad leaves of dark-green giving a fine impression of richness and contrasting vividly with the numerous scarlet blossoms to be seen on the plants. From six to eight months—the latter term as a rule—bring the crop to maturity, and a little frost is then beneficial by shrivelling up the tops and concentrating the starch in the bulbs. Supposing the crop ready to harvest in July or in the beginning of August, when one or two frosts have touched the plants, the manufacture should be at once begun, and carried on until the end of October. If the work is protracted into the spring months, the bulbs begin to shoot, and the yield of starch is consequently lessened in quantity and deficient in quality.

HARVESTING.

When the bulbs have come to maturity—that is, in from eight to nine months after planting—and when the plants have, as stated above, had a touch of frost, then is the time to commence the harvest. Mr. D. Lahey, in a paper entitled “When to Harvest Arrowroot,” said:—

“A good test for ascertaining when arrowroot is ready for digging is the following:—Observe the outer leaf of the bulb. A triangular slit will

be noticed pointing downwards. If the slit appears white, the bulb is still immature, but as soon as it turns purple the crop may be harvested. Arrowroot may be left to stand over for two seasons, as in the case of sugar-cane."

The latter statement is important, for it has happened in some cases that, when the crop was larger than the available mill power was capable of dealing with, the growers turned their cattle into the field. Had the crop been held over, it might have been possible to get it in during the next season, and thus avoid a great deal of extra labour.

When harvesting, the stalks are first cut down with a hoe, cane knife, or reaping hook. The stool is then dug up with a strong mattock or a stout-eyed No. 3 grubbing hoe. A spade or fork is quite useless for the work, as the stool has a strong hold of the ground, in addition to which the bulbs of *Canna edulis* cling firmly together by the masses of rootlets proceeding from each bulb. When free from the soil, the bulbs must be separated, and all earth adhering to them knocked off. As soon as dug, they must be carted to the mill; therefore, it is well not to take up more than can be operated on each day. Every day's exposure to the weather or to the hot sun has an injurious effect upon the colour of the manufactured starch.

The average return of a good crop is about 30 cwt. of starch, or five to six times the quantity in tons of bulbs. From 12 to 20 tons per acre have been dug from a field in which the plants were set at distances of 5 ft. between the plants in rows 6 ft. apart. It goes without saying that the yield will vary according to soil, locality, season, good or bad cultivation, and proper washing, grinding, and drying appliances; but, as a general rule, the yield of starch may be set down at from 15 cwt. to 30 cwt. per acre, although, under most exceptional circumstances, it is recorded that as much as 4 tons of finished arrowroot per acre have been obtained. I cannot, however, vouch for this statement.

MACHINERY AND MANUFACTURE.

The machinery employed in the manufacture of arrowroot in the very early days of agriculture in Queensland was as primitive as that used by the ancient Britons for pounding grain or by the Australian natives for crushing the seeds of nardoo. The first growers made use of a grater made by punching holes with a nail in a piece of kerosene tin. Gradually, improvement crept in, until a hand machine was constructed by the writer which much accelerated the work, but was still only a makeshift.

Since that time modern machinery has been introduced capable of turning out from 10 cwt. to 30 cwt. of commercial arrowroot per day. Such a plant may be thus described:—

Motive power, a 6 to 10 h.p. engine, root washers, carriers, grinding mills, cylinders, elevators, rotary sieves, shaker sieves (two), chute, patent circuitous trough (for which Mr. Lahey holds a patent), agitators and sieves, centrifugals for draining, tables, and calico for drying.

The whole of the work, after the tubers have been raised to the highest point of the building, is effected by gravitation. The tubers (or roots as they are erroneously called), as they come from the field, are tipped from the drays on to the carrier, whence they are automatically carried to the tuber-washing trough. Running through the centre of this is a spindle with diagonally inserted pegs of sufficient length to clear the bottom and sides of the trough by about 1 in. Here the bulbs are thoroughly cleaned of all dirt, stones, &c., and they are then passed on to the grater, which is a large, wooden cylinder covered with perforated iron, burred, on to which the bulbs drop from a hopper. A stream of water pours upon this continuously from above, and the pulp and starch held in suspension pass on to a shaking sieve. From this the farina and water pass to a second sieve, the pulp being ejected on the other side of the first sieve. On leaving this sieve, which is perforated with very fine holes, the water and farina are shot into a large trough, where the latter soon settles at the bottom.

When a sufficient quantity for the day's work has passed into the trough, the farina is allowed to settle firmly, and the water is gradually drawn off through a series of taps till the farina is left in a solid mass at the bottom.

Now, it will be seen that the surface of this mass is covered with a dirty slime. This is washed off and is put aside for pig food, as a certain amount of farina is removed with it during the washing. Water is then again admitted, the farina is stirred up with it, and it then passes through a fine silk sieve into the next trough, leaving the first one clear for the following day's work. After further skimming and washing, the now almost clean product passes into the circular trough which runs right round the building. In this there is an agitator, something like the paddle-wheel of a steamer, which revolves and thoroughly stirs up the whole mass.

When the agitation has proceeded for some time, the farina is once more allowed to settle, and a final superficial washing of the mass takes place.

This process does away with all hand-washing—in fact, from the time when the bulbs are emptied from the drays on to the carrier, they are not handled in any way, except to cut off any stalks which may not have been cut off close enough in the field.

The farina is finally dug from the circular trough, and is passed through a centrifugal machine to extract all possible moisture. It is then taken to the drying ground, where it is exposed to the sun on frames covered with calico. Should a shower of rain fall upon it whilst it is drying, the rainwater has the singular effect of turning the farina brown, when it has to be rewashed. Hence the weather must be carefully watched during the drying process. After being thoroughly dried, the farina, which is now brilliantly white, is bagged and put up in various forms for export.

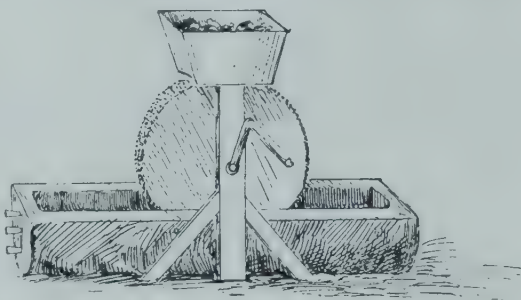
Most mills are constructed on the same plan, and the process is practically the same in all.

It may be interesting here to show how the earliest arrowroot-growers manufactured the farina.

The bulbs were well washed, and all roots pared off. Then they were grated by hand on a grater made of part of a kerosene tin punched full of holes, whose ragged edges served to reduce the bulbs to pulp. This was done over a tub of water. Two or three other tubs covered with calico were provided, and the pulp and farina were separated by working the hand round and round on the calico, water being poured over the mass. The pulp, having been thus separated, was sent to the pigs, and the farina at the bottom of the first tub was well stirred and the water poured off, when the farina passed to the next tub, and so on for three or four washings, when the clean farina was dried on calico frames. This process was necessarily a very slow one, but, as arrowroot was then worth 1s. per lb., it was very remunerative.

The writer improved upon this by constructing the primitive machine here depicted.

A log about 2 ft. in diameter and 8 ft. long was hollowed out by axe and adze to form a trough. At the head of this trough was fixed a framework much like the wooden stand of a grindstone. A large wheel was then cut from a sound log 3 ft. in diameter and 1 ft. wide. Tin plates, turned into graters (which required frequent renewal) by punching holes in them with a nail, were next nailed on to the edge of the wheel, to which a wooden axle and handle were fitted. The wheel, when placed in position, turned in the water with which the trough was filled. Above the wheel was a wooden hopper from which the bulbs dropped on to the wheel. This wheel was easily turned by one man, and the grated bulbs dropped into the water in the shape of pulp and farina. The latter gradually settled at the bottom, and the pulp was removed by a narrow-tined fork and by hand. After a short interval to allow the farina to settle down firmly, pegs were withdrawn from the lower end of the trough and the water drawn off. The farina was then dug out of the bottom of the trough, and was passed through calico stretched over a tub. By hand-stirring and at the same time pouring on clean water, the whole of the farina passed through the calico into the tub, leaving the gross impurities behind. This operation was repeated three or four times until the arrowroot was perfectly white and free from any foreign substance.



PRIMITIVE HOME-MADE ARROWROOT-MILL.

After the last washing, it was placed on shallow trays or calico frames and dried in the sun. The arrowroot at that time (1863) was readily sold locally at 1s. per lb., and a small quantity sent to London brought 1s. 6d. per lb.

Such a machine to-day would only prove a source of loss to the grower.

With the present up-to-date arrowroot-mills, the whole process—from the digging of the bulbs to the drying of the prepared farina—occupies about twenty-four hours.

It will easily be understood, from what I have written about the process of manufacture, that it is of little use trying to manufacture arrowroot unless there is a plentiful supply of good clean water.

One of the principal growers and manufacturers at Yatala, near Beenleigh, estimated that, when working his mill three days a week and producing about half a ton of arrowroot a day, 24,000 gallons of water were used every eight hours. The refuse fibre and pulp are carted back to the fields and utilised as manure.

Another grower stated that arrowroot gave a monetary return about equal to that from maize and potatoes; but it was a surer crop. It would stand flooding that would kill potatoes, and dry weather would not affect it so adversely as it would corn. Both these troubles I have experienced, and can quite bear out his statement.

YIELD AND VALUE OF CROP.

The yield of commercial farina may be set down at from 1 to even 2 tons per acre, and the price ranges from £16 to £20 per ton. Late market reports give the price in London at from 7d. to 8d.* per lb.; Bermuda being quoted in October, 1911, at 1s. 7d. per lb.

A considerable item of expense in the manufacture is the cost of firewood, seeing that it takes a cord of wood for each ton of tubers. The tubers contain from 20 to 30 per cent. of starch or 400 to 600 lb. of starch per ton of tubers.

COST OF MACHINERY FOR ARROWROOT AND CORNFLOUR.

Such a mill as I have described would cost, according to capacity, from £500 to £1,200, exclusive of about £200 for the necessary drying and storage sheds. Where cornflour is made, the cost of a mill may run to over £4,000, owing to additional and more complicated machinery for producing this product, although the process is much akin to the manufacture of arrowroot. Briefly, the corn (maize) is first steeped in hot water, and is then ground between large millstones, after which it passes through sieves into huge vats, when it settles, and the gluten remains on the surface. This gluten cannot be washed off without the aid of chemicals.

In the principal arrowroot-growing districts abovementioned there were, in 1916-17, 324 acres planted, mostly in small areas. According to the Government Statistician's annual report published in 1917, the yield of bulbs amounted to 3,506 tons—an average of 10.82 tons per acre—from 3,203 tons of which were produced 663,779 lb. of commercial arrowroot.

* Prices here quoted are probably higher since 1912.

SUGAR PROSPECTS IN THE NORTH.

The General Superintendent of the Bureau of Sugar Experiment Stations has received a report from Mr. A. P. Gibson, the Field Assistant, in which he states that during the month of May he visited the Mossman, Inkerman, Ayr, and Haughton River sugar lands.

At Mossman, Mr. Gibson states, cultivation is improving, but there is still room for an advance in this matter. He is of the opinion that liming and green manuring, combined with subsoiling, is essential. At the time of his visit planting was going on to some extent, the favoured varieties being HQ426, New Guinea 24B, D1135, and New Guinea 15. Subsequent cultivation was not good in many places, the resultant crop becoming entangled by weeds, necessitating burning previous to cutting. The rats have not done so much damage recently, being kept in check by poisoning—cocoanuts being split and dusted with arsenic and distributed about the infested areas. A good deal of the D1135 cane was arrowing. It was expected that 63,000 tons should be treated this season and abundance of labour is at hand for all requirements. Several Mowbray seedlings were inspected, and appeared promising. If the analytical tests are satisfactory, it is expected they will be sent to the Sugar Experiment Station.

At the Lower Burdekin good rains were experienced in the early part of the year, which caused considerable damage. Since then, however, the rainfall has been scanty. The heavy wet at the beginning of the year cut the crushing short and left unharvested about 200,000 tons.

The Inkerman district, which a few years ago was given up to pasturage, now possesses one of the largest and most modern sugar factories in Australia, and is surrounded by something like 176,000 tons of beautiful emerald green canefields. The crop is more than sufficient to keep this mill working full time during the season. It is anticipated that the whole tonnage for the Lower Burdekin district will be 580,000 tons, but it is considered that only about 384,000 tons of this can be crushed. This will, therefore, leave another standover crop of 196,000 tons. If the whole crop could be treated, it would have resulted in something like 72,000 tons of sugar, which would be the biggest yield of any one district in Queensland. Unfortunately, the estimated tonnage is being lessened by crop deterioration.

The Home Hill Government Irrigation Scheme is far from being completed, as great difficulty has been met in securing necessary requirements. The survey lines have been cleared in readiness for the poles which are to carry the electric cables. The making of concrete well-cases is to be commenced very soon, and it is anticipated that the township of Home Hill will be lit up by electricity by the end of the present year.

At Haughton River the growers have an estimated crop of 46,000 tons, 18,000 of which is standover. The growers are working for a sugar factory of their own, and are at the present time negotiating with the owners of Invicta Mill, near Bundaberg, for its purchase. Very fertile land and crops can be seen on the river lands, but Mr. Gibson thinks that this land could be improved and the yield increased, firstly by drainage, and secondly by the application of irrigation, which would have to be obtained from the many magnificent deep lagoons found hereabouts. Insufficient milling power is a drawback to this district at the present time.

KILLING WEEDS IN CANEFIELDS.

An interesting method of killing weeds in sugar-cane fields in Hawaii consists in spreading over the fields, after the dormant canes have been manured, strips of tarred or asphalted felt paper (weighing 9 lb. to the 100 square feet). The pointed shoots of the young cane grow through the paper, which is weighted with stones, and the softer-tipped weeds, failing to penetrate it, are smothered. A similar practice has been employed in England in making lawns. The seed is sown on a treated perishable fabric.

Botany.

ON A PECULAR SUBTERRANEAN FRUITING HABIT OF *VIGNA LANCEOLATA*, R. BR., WITH DESCRIPTION OF A NEW VARIETY.

By C. T. WHITE, Government Botanist.

Some years ago Mr. R. E. Soutter, Manager of the State Farm, Bungeworgorai, near Roma, sent to the late F. M. Bailey specimens of a native vetch showing a remarkable subterranean fruiting habit. The specimens were placed away in the herbarium with a query as to the identification; and at the end of last season Mr. Soutter again forwarded specimens to the Department. These enable me to determine it as *Vigna lanceolata*.

Mr. Soutter sends two forms of the plant—one with the typical narrow leaves of *V. lanceolata*, and the other with much broader leaves approaching in this respect to *V. luteola*; this latter I have named *var. latifolia*.*

In answer to inquiries, Mr. Soutter informs us that both forms are indigenous in his locality, and that they both produce seed above and below ground. He says:—"They produce seed above ground in a manner similar to cow-peas, only, of course, the seeds and pods are much smaller; the seeds themselves are dark (mottled), and the flowers yellow." He further states that the plants are greatly relished by stock, and are valuable native fodders.

From a botanical point of view, the observation of bimorphic fructification in *Vigna lanceolata* is particularly interesting, as showing a connecting link between the genera *Vigna* and *Voandzeia*.

In *Arachis hypogaea* (the common Pea Nut or Earth Nut) the flowers are produced above ground in the usual manner, but the pods ripen under the surface of the soil, the pedicels lengthening out after the withering of the flower and development of the ovary, and then turning down and entering the earth.

* *Vigna lanceolata* var. *latifolia*, C. T. White; varietas nova foliolis rhombicis ovatis ad 3 cm. latis.



PLATE 7.—*VIGNA LANCEOLATA*.

A. Flowering shoot (natural size).
 B. Calyx.
 C. Standard.
 D. Wing petal.

E. Keel petal.
 F. Pistil.
 G. Seed.

(B and G enlarged.)

PLATE 8.—*VIGNA LANCEOLATA*, *var. LATIFOLIA*.

- A. Flowering shoot.
 B. Underground shoots.—1, Main stem; 2, Secondary subterranean stems; 3, Pedicels; 4, Pods
 5, Ground-line.
 C. Seed.

(All natural size.)

The following account by I. H. Burkill in the Kew Bulletin, 1906, page 70, describes the habit of *Voandzeia subterranea* (the Bambarra or African Ground Nut):—"As the name 'ground nut' implies, the seeds mature under ground. To facilitate the necessary burial of the pod, for none mature that cannot bury [Correa de Mello, in Journ. Linn. Soc. XI., 254], the short, somewhat flattened hairy branches lie prone on the surface of the earth, often penetrating it where soft and always dipping downwards at the tip. On the primary and a few of the secondary branches are a few leaves—large, erect, and trifoliate. The inflorescences, either terminal or from the axils of the leaves, are two-flowered and invariably penetrate the earth unless prevented by some solid body. The flowers thus produced underground—one on each side of a wart-like termination to the axis—may remain subterranean or may reach the surface by the elongation of the pedicel and open as small yellow pea-like blossoms. In fruiting, the ovary is drawn underground. The subterranean flowers—provided, like the aerial, with pedicels—lie folded on to these, and do not develop any of the conspicuous parts; their petals are absent, and so reduced are the stamens that observers have thought them female."

From what I can see by specimens sent of *Vigna lanceolata*, the subterranean fruiting habit is somewhat that of *Voandzeia*—not like that of *Arachis*. Certain of the secondary branches, instead of ascending in the usual manner, enter the soil and extend for some distance underground; flowers are borne here and there on fairly long peduncles in the usual way in axils where normally leaves would develop. The texture of the valves of the pods borne underground is of a thin almost papery nature, not like the firm, tough character of the pods on the same plant borne in the usual manner. Many of these subterranean branches, after travelling some distance underground, emerge and ascend in the usual fashion.

Whether the flowers are throughout the whole of their cycle subterranean, or whether they emerge and are drawn down again into the soil as the ovary develops, I cannot say, but incline strongly to the opinion that they are always subterranean. This point, however, can only be proved by actual observation on the growing plants, which I hope Mr. Soutter will do and communicate at a later date.

In the accompanying plates the first represents a typical specimen of *Vigna lanceolata* with normal fructification; the underground pods are not figured. The second represents the variety *latifolia*, and shows the habit of the subterranean stems, which often extend for a couple of feet or more before emerging, ascending, and flowering, &c., in the normal manner.

Entomology.

CANE GRUB INVESTIGATIONS.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report upon Cane Grub Investigations from the Entomologists, Messrs. J. F. Illingworth and E. Jarvis:—

Attention must again be called to the value of cultural methods as a factor in the control of cane grubs; at the same time correcting some of the statements that appeared, inadvertently, in reporting last month. As was then stated it is still rather early to draw definite conclusions, but the splendid appearance of certain fields, both at Meringa and at Greenhills, is encouraging.

Late planting (October) appears to be of considerable importance for infested areas. If cane is regularly cultivated, the soil is actively worked during the flight and oviposition of the beetles; and from present observations this constant stirring of the soil either deters the beetles from laying their eggs, or if they are laid, breaks up the egg-chambers, which are only a few inches below the surface, and prevents the hatching of the young grubs. At any rate, cane planted in October, this season, is in very good condition in both of the above regions; even though the fields are situated right in the midst of the infested areas, with grub-destroyed cane immediately adjoining.

By cutting these fields late, say, next November or December, it may be possible to ratoon them so as to again avoid an attack of the beetles, for the ploughing and cultivation will coincide with their period of oviposition. We are led to this conclusion from observations at Greenhills, where certain fields, which were cut during last December, situated right in the midst of the infested area, have been successfully ratooned with little apparent injury from the grubs.

We had experiments planned for planting areas at Greenhills both in November and December, this last season, but a rush of cutting and other work made it impossible to get in these experimental plots. Now, however, since the October planting looks so well, we are doubly anxious to see the results of experiments in later planting on soils which will permit working during the rainy season. We shall be very grateful for information from growers who have had any experience with late planting as a means of grub-control.

Though our experiments in summer fallowing were not as complete a success as we could have wished, in either of the districts noted above, due to the rapid development of certain grasses upon the ploughed ground, there was certainly a very decided decrease in the number of grubs turned up by the plough in these plots, as compared with areas that had not been fallowed. Undoubtedly, if the infested fields could

be well worked and kept clean during December, or through the period of oviposition of the beetles, very few eggs would be laid in them, and most of the resulting grubs would be destroyed by subsequent ploughing, preparatory to early planting. Right along this line, we recently had an excellent letter from a grower, who claims that after suffering from the ravages of the grubs for twenty-five years he has at last succeeded in raising a clean crop by having his ground well worked by December, preparatory to early planting. He states that he does not try to ratoon on this infested land, for ratooning multiplies the pest; and that all stand-over cane in the district should be destroyed. We certainly would emphasize the ploughing out of all stand-over cane, for it acts as a breeding ground for all sorts of cane pests.

The facts that allied beetles in America will not deposit their eggs in fields covered with clover led us to experiment with Mauritius beans as a cover crop here. We have not, however, found that this cover offers a complete protection, for upon ploughing the beans under during January a good many grubs turned up. The abundant humus-forming material supplied by the green-crop will, however, undoubtedly supply these grubs, so that they will not do serious harm to the cane which has been recently planted on the land. A possible explanation for the ovipositing of the beetles in these plots is that there was a rather abundant scattering of Natal grass present, and this may have attracted the insects.

LEPIDIOTA FRENCHI IN VIRGIN SOIL.

It is interesting to note the habit of this species in favouring uncultivated areas for ovipositing. One can dig almost anywhere in blady-grass, at this season, and find the grubs. Those of the present year are now in the second stage, and rather small, while last year's grubs are in the third or final stage, and are forming resting cells in which they pupate, preparatory to emergence as beetles next December. The third stage grubs have practically finished their feeding now; but those of the second stage will continue for another year yet, so it is unsafe to use grass-land immediately for cane if the small grubs are found very abundant when ploughing.

NOTES ON LEPIDIOTA ROTHEI.

In a recent report (January) mention was made of the occurrence at Meringa of the small cockchafer *Lepidiota rothei*, Blackburn, in considerable numbers during December and part of January. Although of minor importance as a cane pest it was thought desirable at the time to breed *Rothei* from the egg, in order to determine the duration of its life cycle. This insect emerges about the same time as *frenchi*, from which, however, it differs in being decidedly smaller and of darker colouration. The following brief allusion to the earlier stages of its life cycle may be of interest:—

The eggs are laid from seven to twelve days after copulation, the numbers obtained from individual females confined in cages varying

from four to twelve. Like those of *frenchi*—which they resemble in general appearance—these eggs, although placed close together, are not massed in a single large chamber, but deposited separately, each egg being isolated in a tiny cavity. An interval of from nine to eleven days elapses between the acts of oviposition and emergence of the young grubs; while the first larval stage occupies a period of about ten weeks. This, however, may vary considerably, as in some instances grubs remained four months or longer in the first stage, and in one cage, for example, we found first, second and third stage larvæ derived from eggs hatched together and living under precisely similar conditions in respect to temperature, moisture, and food supply. The interval from second to third instars is about six weeks; and third stage larvæ were obtained from our breeding cages by 28th April.

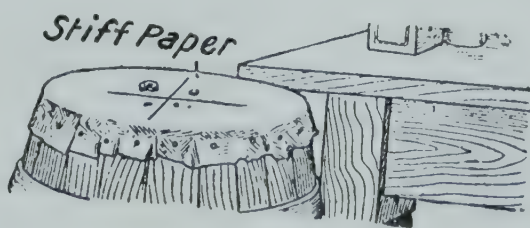
NOTES ON LEPIDIOTA ALBOHIRTA.

Investigations conducted at Meringa on volcanic land suffering from severe grub attack revealed the fact that 10 per cent. of the grubs after having eaten every root were actively devouring the last few inches of stalk still attached to the old sets, the remnants of cane that had been previously bitten off level with the ground. These pieces of stalk were hollowed out and reduced to shell-like fragments, even the hard outside rind being eaten; which would seem to indicate that instead of travelling in search of fresh succulent cane roots the grubs are content to continue feeding on such vegetable tissue as may be readily available even though less palatable.

The remaining 90 per cent. of larvæ unearthed on this occasion had formed cells in the hard soil preparatory to pupating; 70 per cent. of these being found at depths varying from 11 to 18 inches.

SELF-SETTING RAT TRAP.

The "S. A. Farmers' Advocate" says that a suburbanite successfully trapped a bunch of rats by stretching a piece of stout elastic paper on the top of an open barrel. Spreading food on this paper, he allowed



it to remain until the suspicions of the rats were allayed; then he cut two right-angled slashes in the paper with a razor. Next morning he found seven of the pests in the barrel.

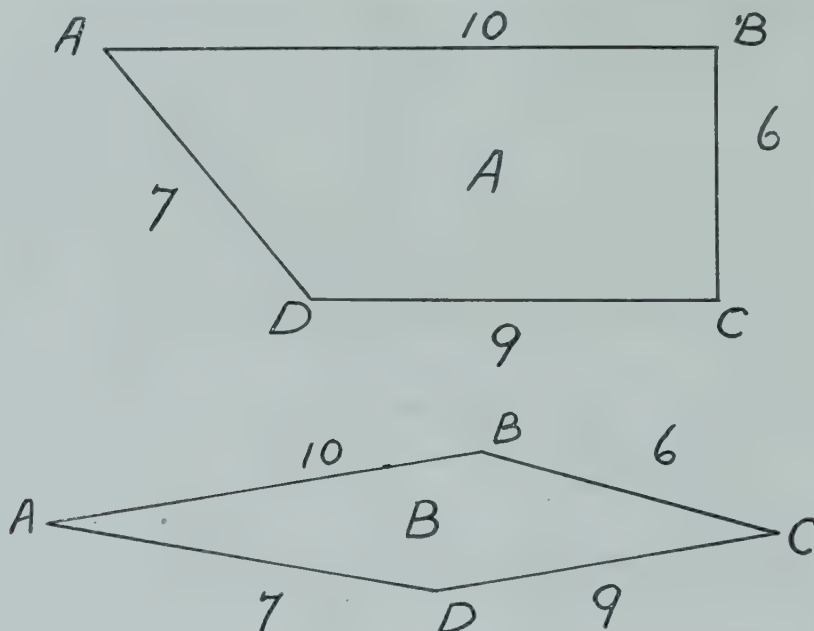
General Notes.

MEASURING LAND WITHOUT THE AID OF INSTRUMENTS.

We have received from two valued correspondents professional criticism of the instructions given in the May issue of the Journal for measuring land without the aid of instruments. Space will not admit of the publication of both explanations, showing where the original formula is faulty, in this issue of the Journal. One of our correspondents writes:—

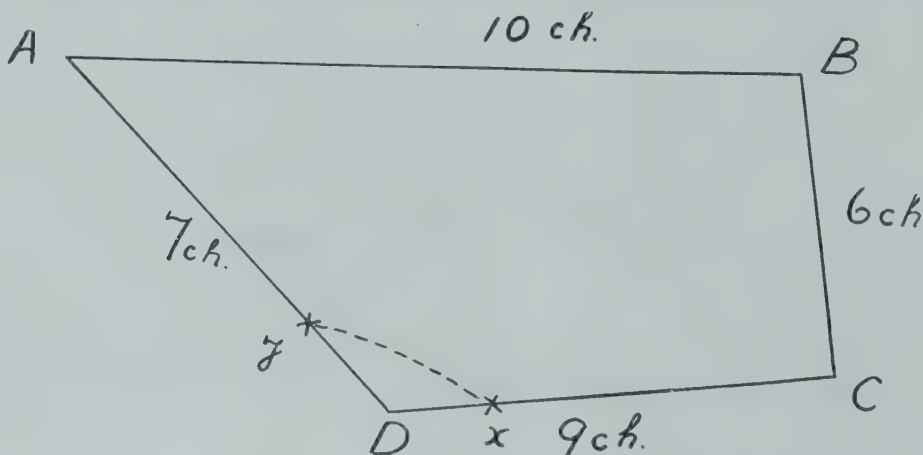
“In the notes on this subject, published in the May issue of the Journal, the writer completely lost sight of the fact that the measurements of the four sides of an area cannot accurately define the shape of that area, and consequently no formula involving the use of the four sides alone can be used to compute the area. Additional data is absolutely necessary.

“This may be seen from the following diagrams of a figure whose sides are 10, 6, 9, and 7 chains long, respectively. It will be noted that in this case $10 + 6 = 9 + 7$. These figures are used designedly to illustrate the absurdity of the method referred to above:—



“It is obvious, on inspection, that the area of figure A (as near a rectangle as possible) is much greater than that of B, and the nearer the angles B and D approach one another the smaller the area enclosed becomes, until with the sides mentioned B and D can meet, and the whole forms one straight line.

“It is necessary, therefore, that (1) a diagonal be measured from either A to C or B to D (preferably both, the one to act as a check upon the other in the final calculation), or (2) one or more angles be measured. As we are still assuming that no instruments are available, other than the chain, the following method of measuring the angles may be adopted:—



“To measure the angle, say, at D, chain a convenient distance ($\frac{1}{2}$ chain or 1 chain) along D C to x , and the same distance along D A to, say, y , then chain $x y$, say, 170 links. This will enable the angle at D to be plotted on paper, but although one angle in a four-sided figure is sufficient, another should be measured to act as a check on the first.

“Such a method of measuring the angles is sometimes necessary when, owing to the presence of a crop, standing timber, or other obstruction, it is impossible to chain the diagonals.

“In cases where a fair amount of accuracy is necessary and the diagonal has been measured, the area of each triangle into which the field has been divided can be calculated (without plotting) by using the formula

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

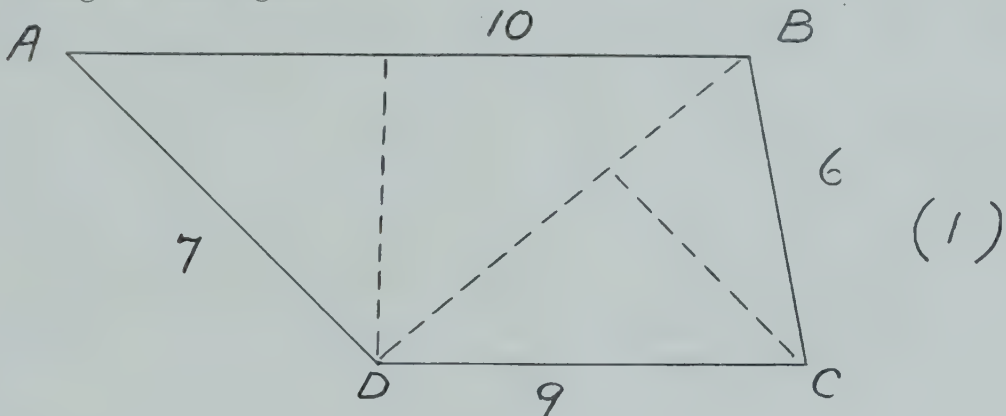
in which s = half the sum of the sides and $a b c$ the respective sides.

“Taking a very simple case, which does not involve fractions, a triangle has sides of 26, 24, and 10 chains, respectively; s then becomes $\frac{1}{2}(26 + 24 + 10) = 30$. Using the figures instead of letters, we have

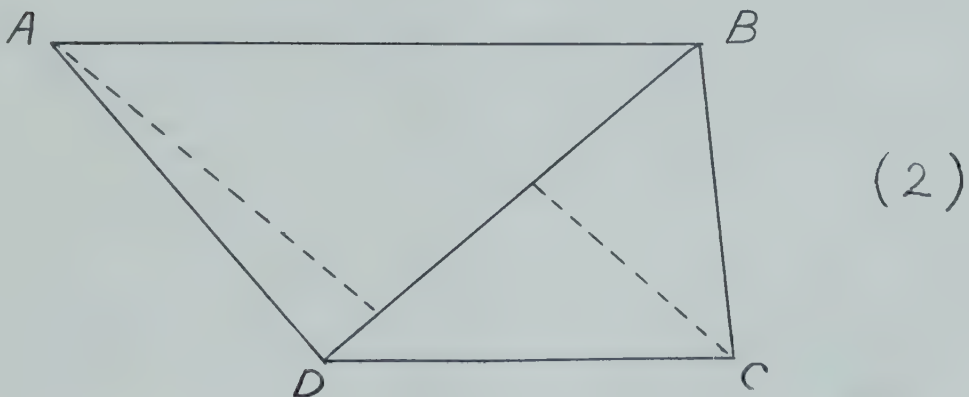
$$\begin{aligned} \text{Area} &= \sqrt{30(30-26)(30-24)(30-10)} \\ &= \sqrt{30 \times 4 \times 6 \times 20} \\ &= \sqrt{14400} \\ &= 120 \text{ sq. ch. or 12 acres.} \end{aligned}$$

In cases where only an approximation of the area is required, the easiest way is to plot the figure to a known scale, drop perpendiculars to a convenient side of each triangle and calculate the area of each by multiplying the base by half the height.

“Using the same figure:—



or



Using as a base a measured line as A B in (1) will reduce the margin of error because the measured line is more likely to be accurate than a scaled line.

“There is no doubt that a better knowledge of the areas of the various paddocks and crops will enable the farmer to more correctly gauge the actual yields, and thus conduce to an increased efficiency in agricultural practice.”

Answers to Correspondents.

SPLITTING SHINGLES.

SELECTING A TREE.

In reply to a correspondent asking for instruction in splitting shingles, method of placing them on a roof, &c., a splitter of the olden time writes:—

Shingles, in the days when most houses both in towns and in the country were universally roofed with them, were of Moreton Bay pine and some of the hardwoods. Of the latter ironbark was considered the best, although stringy bark and spotted gum were also used. Good shingles cannot be made from blood wood.

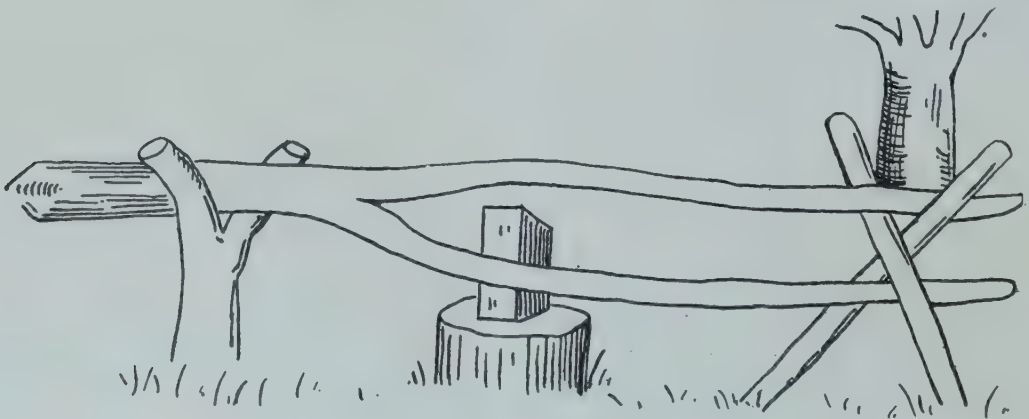
Pine shingles are preferred by some, owing to their lightness and to their not discolouring the water from the roof. Another advantage in their favour is that they do not require boring, as is necessarily the case with hardwood shingles. These latter discolour the rain water for some time after being laid, but they are far more lasting than the former.

The most important matter, and one requiring great judgment and experience, is the selecting of a tree suitable for shingle-splitting. Many old splitters can tell at a glance whether a tree will "run" freely or not by examining the bark of an ironbark or stringy-bark, and, from its corrugations, will judge of the toughness or otherwise of the timber. If the perpendicular corrugations run in parallel lines, the tree will, in all probability, be easy to "burst." If, on the other hand, the lines are interlocked, the timber will probably be the same, and take great labour to open, and then not run evenly; or, if winding, the resulting shingles would be useless, although the tree would not be lost, but might be utilised for fence posts. As a rule, a tree hard to "burst" will "run" more evenly than one which bursts freely. One good way to tell a suitable tree is to cut out a large chip and split it. If it splits freely, it is probable, but not always certain, that the whole tree will split well. It sometimes happens that the chip is hard to split, or is very stringy and interlocked, yet the upper portion of the tree may split well and run evenly, so that, after all, the chip is no certain guide. An experienced splitter can generally tell if a tree is hollow by noticing that some of the broken limbs are hollow, and that sometimes branches shoot out from the main stem almost from top to bottom. Such a tree is pretty sure to have a pipe, which makes it all the easier to split. A tree plentifully besprinkled with large round knots should not be rejected on that account, for such knots are rarely found to extend, which latter is of no use to the shingle-splitter. Suppose the tree to be selected. It should be a good-sized one with a straight barrel, from 2 to 4 ft. in diameter, with a length sufficient to give 16 to 20 good shingle blocks. The larger the girth and the longer the log, the less the labour.

The blocks for shingles are cut off about 15 to 17 in. in length, and are burst into billets of a width of 6 in.

Some preparations are required for splitting shingles.

First, a "horse" has to be erected. This consists of a stout forked sapling with a butt about 3 ft. long and about 6 in. in diameter. This butt is supported against a tree, at a height of about 2 ft. from the ground, on a leaning fork. The two ends of the branches forming the horse are supported by two saplings standing crosswise against another tree as shown in the figure:—



A block is placed on the ground, which serves to support the billet which has to be split into shingles. The splitter has his billets lying handy, and usually piles up a dozen on the left side of the horse. With his shingle "throw" in his left hand and



wooden mallet in the right, he halves the billets, then quarters them, then halves these quarters, and so on until the whole billet is split into shingles about a quarter of an inch thick or even less. The sap shingle is usually thrown away, and no shingle under 3 in. in width is retained, the hearts and outsides being rejected.

Some splitters run each shingle off separately, but this requires judgment, as, when the first shingle is off, the next may run to a thick end, and the third to a thin end, and wedge-shaped shingles are not desirable. The halving and quartering principle is undoubtedly the best.

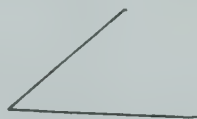
A good splitter will run out 1,000 hardwood or often as many as 2,000 pine shingles in a day's work, but not in an eight-hour day

LAYING ON SHINGLES.


From 400 to 600 shingles will cover a square of roofing. The battens should be about 3 in. apart. The first row on the eave requires to be about half the length of the succeeding rows. The second row will cover the whole of the first. After this, each shingle of the succeeding rows should cover the space between the shingles of the row below it, thus:—



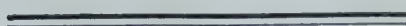
The pitch of the roof should be at about an angle of 45 degrees.



If necessary, the angles of the roof may be made perfectly water-tight by mitreing

the covering shingles  in this shape, the mitred shingles being sawn in half diagonally. The lower part of these shingles must be in line with the rows on both sides.

Hardwood shingles should be bored before nailing on, but both split and sawn pine shingles need not be bored. In nailing on shingles care must be taken that the nail heads of each row of shingles be covered by the shingles in the succeeding row above it.



The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JUNE, 1918.

Article.								JUNE.
								Prices.
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.
Barley	...	...	...	...	...	...	bush.	3s. 6d.
Bran	...	...	...	...	...	...	ton	£6 10s.
Broom Millet	...	...	...	...	...	...	"	£35 to £45
Broom Millet (Sydney price)	...	...	...	...	...	...	"	£95
Butter (First Grade)	...	...	...	...	...	...	cwt.	128s. 6d.
Chaff, Mixed	...	...	...	...	...	...	ton	£6 10s. to £6 11s.
Chaff, Oaten (Imported)	...	...	...	...	...	...	"	£6 10s. to £7 10s.
Chaff, Lucerne	...	...	...	...	...	...	"	£5 15s. to £10
Chaff, Wheaten	...	...	...	...	...	...	"	£5
Cheese	...	...	...	...	...	...	lb.	7½d. to 10½d.
Flour	...	...	...	...	...	...	ton	£12
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.
Hay, Oaten (Victorian)	...	...	...	...	...	...	ton	£9 10s.
Hay, Lucerne	...	...	...	...	...	...	"	£3 10s. to £5 10s.
Hay, Wheaten	...	...	...	...	...	...	"	£4 to £5 10s.
Honey	...	...	...	...	...	...	lb.	3½d. to 4d.
Maize	...	...	...	...	...	...	bush.	4s. 2d.
Oats	...	...	...	...	...	...	"	4s. 6d.
Onions	...	...	...	...	...	...	ton	£17 10s. to £18 10s.
Peanuts	...	...	...	...	...	...	lb.	4d. to 5d.
Pollard	...	...	...	...	...	...	ton	£6 10s. to £7 10s.
Potatoes	...	...	...	...	...	...	"	£6 to £9
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	2s. 6d. to 2s. 11d.
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£3 15s.
Eggs	...	...	...	...	...	...	doz.	1s. 7d. to 2s. 2d.
Fowls	...	...	...	...	...	...	per pair	3s. 1d. to 12s. 6d.
Ducks, English	...	...	...	...	...	...	"	3s. 1d.
Ducks, Muscovy	...	...	...	...	...	...	"	3s. 8d. to 7s.
Geese	...	...	...	...	...	...	"	6s. to 6s. 6d.
Turkeys (Hens)	...	...	...	...	...	...	"	10s. to 11s. 3d.
Turkeys (Gobblers)	...	...	...	...	...	...	"	15s. 6d. to 22s. 6d.
Wheat (Milling)	...	...	...	...	...	...	bush.	5s. 3d. to 5s. 6d.

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	1s. 6d. to 3s.
Beetroot, per sugar-bag	...	...	...	...	...	...	6d. to 9d.
Cabbages, per dozen	...	...	...	...	...	...	2s. to 5s.
Carrots, per sugar-bag	...	...	...	...	...	...	2s. 6d. to 5s.
Cauliflowers, per dozen	...	...	...	...	...	...	8s. to 16s. 3d.
Chokos, per quarter-case	...	...	...	...	...	...	1s. 3d. to 1s. 5d.
Cucumbers, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Marrows, per dozen	...	...	...	...	...	...	2s. to 3s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	...	6d. to 1s.
Peas, per sugar-bag	...	...	...	...	...	...	6s. to 9s. 6d.
Sweet Potatoes, per cwt.	...	...	...	...	...	...	2s. 9d. to 2s. 10d.
Table Pumpkins, per cwt.	...	...	...	...	...	...	3s. to 3s. 6d.
Tomatoes, per quarter-case	...	...	...	...	...	...	2s. to 5s. 9d.

SOUTHERN FRUIT MARKETS.

Article.	JUNE.					
	Prices.					
Bananas (Queensland), per case	12s. to 17s.
Bananas (Tweed River), per case	14s. to 21s.
Bananas (Fiji), per bunch...	7s. to 8s. 5d.
Bananas (G.M.), per bunch	7s. to 8s. 5d.
Bananas (G.M.), per case	20s. to 23s.
Lemons (local), per bushel-case	5s. to 6s.
Mandarins, per bushel-case	8s. "
Oranges (Navel), per case	2s. 6d. to 9s.
Papaw Apples, (Queensland), per quarter-case	8s.
Passion Fruit, per half-case	11s.
Persimmons, per half bushel-case	2s. 6d. to 4s. 6d
Pineapples (Queens), per double-case	9s. to 11s.
Pineapples (Ripleys), per double-case	8s. to 9s.
Tomatoes (Queensland), per half-case	2s. to 4s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JUNE.					
	Prices.					
Apples, Eating, per case	7s. to 10s. 6d.
Apples, Cooking, per case	8s. to 10s. 6d.
Apricots, per case
Bananas (Cavendish), per dozen	2d. to 5½d.
Bananas (Sugar), per dozen	4d. to 5½d.
Cape Gooseberries, per small box
Citrons, per hundredweight	8s.
Cocoanuts, per sack	15s. to 25s.
Cumquats, per quarter-case	3s. to 3s. 6d.
Custard Apples, per tray	2s. to 5s. 6d.
Lemons (Lisbon), per quarter-case	3s. 6s. to 8s.
Mandarins, per case	7s. 6d. to 10s.
Mangoes, per quarter-case	7s. to 12s.
Oranges (Navel), per case	6s. 6d. to 8s. 6d.
Oranges (Seville), per case	14s.
Oranges (Other), per case	3s. to 4s. 6d.
Papaw Apples, per quarter-case	2s. to 3s.
Passion Fruit, per half-bushel case	6s. to 7s. 6d.
Peaches, per quarter-case
Pears, per half-bushel case
Peanuts, per lb.	4d. to 5d.
Persimmons, per quarter-case	1s. 8d. to 2s. 6d.
Pineapples (Ripley), per dozen	1s. to 2s.
Pineapples (Rough), per dozen	6d. to 1s.
Pineapples (Smooth), per dozen	1s. to 2s. 6d.
Plums, per quarter-case
Pomelos (poor man's orange) per case	9s. to 13s.
Rockmelons, per dozen
Rosellas, per sugar bag	3s. 6d. to 5s.
Tomatoes, per quarter-case	2s. to 3s. 6d.
Strawberries, per dozen boxes	4s. to 10s.

TOP PRICES, ENOGGERA YARDS, MAY, 1918.

Animal.	MAY.	
	Prices.	
Bullocks	£18 to £23	
Cows	£13 7s. 6d. to £18 2s. 6d.	
Cows (Single) ... ..	...
Merino Wethers	41s. 3d.	
Crossbred Wethers	49s. 6d.	
Merino Ewes	35s.	
Crossbred Ewes	37s.	
Lambs	40s. 3d.	
Pigs (Baconers) ... ..	...
Pigs (Porkers)	45s. 9d.	
Pigs (Slips)	24s. 6d.	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MAY, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MAY, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	May.	No. of Years' Records.	May, 1918.	May, 1917.		May.	No. of Years' Records.	May, 1918.	May, 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Asherton	2·13	17	2·24	3·26	Nambour	4·91	22	6·59	3·60
Cairns	4·49	36	3·81	2·39	Nanango	1·67	36	0·48	0·46
Cardwell	3·60	46	2·01	3·56	Rockhampton	1·54	31	1·02	1·09
Cooktown	2·96	42	1·18	1·47	Woodford	2·90	31	2·75	0·66
Herberton	1·65	31	0·91	3·83	<i>Darling Downs.</i>				
Ingham	3·48	26	2·20	3·75	Dalby	1·35	48	0·24	0·03
Innisfail	12·45	37	7·36	17·49	Emu Vale	1·21	...	0·31	0·11
Mossman	2·52	10	1·18	4·70	Jimbour	1·28	...	0·16	Nil
Townsville	1·39	47	0·01	2·40	Miles	1·70	33	0·32	0·06
<i>Central Coast.</i>					Stanthorpe	1·98	45	0·27	0·15
Ayr	1·20	31	0·04	2·66	Toowoomba	2·35	46	0·78	0·37
Bowen	1·39	47	0·26	1·51	Warwick	1·67	31	0·23	Nil
Charters Towers	0·82	36	Nil	1·35	<i>Maranoa.</i>				
Mackay	3·89	47	2·04	1·65	Roma	1·57	44	0·06	Nil
Proserpine	5·35	15	5·08	2·39	<i>State Farms, &c.</i>				
St. Lawrence	1·87	47	1·33	1·01	Bungeworgorai	0·65	4	0·05	0·02
<i>South Coast.</i>					Gatton College	1·87	...	1·02	0·15
Biggenden	1·97	...	0·76	0·92	Gindie	1·10	...	1·84	0·10
Bundaberg	2·78	35	1·01	1·84	Hermitage	1·30	...	0·23	0·02
Brisbane	2·90	67	2·49	0·48	Kairi	1·69	4	1·65	2·95
Childers	2·44	23	1·01	1·69	Kamerunga	4·32	...	3·45	2·55
Crohamhurst	5·00	25	5·09	2·47	Sugar Experiment Station, Mackay	3·68	...	...	2·99
Esk	2·14	31	0·53	0·25	Warren	0·37	4	0·53	0·17
Gayndah	1·63	47	0·54	1·09					
Gympie	3·09	48	1·91	1·61					
Glasshouse M'tains	3·33	10	3·33	2·18					
Kilkivan	2·02	39	0·98	0·77					
Maryborough	3·12	47	1·95	2·54					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for May this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

Farm and Garden Notes for August.

This and the following two months are about the busiest periods of the year so far as work in the field is concerned; and the more activity now displayed in getting in the summer crops, the richer will be the reward at harvest time. Potatoes should be planted, taking care to select only good, sound seed that has sprouted. This will ensure an even crop. Yams, arrowroot, ginger, sisal hemp, cotton, and sugar-cane may now be planted. Sow maize for an early crop. If the seed of prolific varieties is regularly saved, in the end it will not be surprising to find from four to six cobs on each stalk. This has been the experience in America, where the selecting of seeds has been reduced to a fine art.

In choosing maize for seed, select the large, well-filled, flat grains. It has been shown that, by constantly selecting seed from prolific plants, as many as five and six cobs of maize can be produced on each stalk all over a field. A change of seed from another district is also beneficial. Sow pumpkins, either amongst the maize or separately, if you have the ground to spare. Swede turnips, clover, and lucerne may be sown, but they will have to contend with weeds, which will begin to vigorously assert themselves as the weather gets warmer; therefore, keep the hoe and cultivator constantly going in fine weather. Tobacco may be sown during this month. If vines are available, sweet potatoes may be planted towards the end of the month. In this case also it is advisable to avoid too frequent planting of cuttings from the old vines; and to obtain cuttings from other districts. If grasses have not yet been sown, there is still time to do so, if the work be taken in hand at once. Sugar-cane crushing will now be in full swing, and all frosted cane in the Southern district should be put through the rollers first. Plough out old canes, and get the land in order for replanting. Worn-out sugar lands in the Central and Northern districts, if not intended to be manured and replanted, will bear excellent crops of sisal hemp. Rice and coffee should already have been harvested in the North. The picking of Liberian coffee, however, only begins this month. Collect divi-divi pods. Orange-trees will be in blossom, and coffee-trees in bloom for the second time. As this is generally a dry month in the North, little can be done in the way of planting.

Kitchen Garden.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown, which will keep the market gardeners busy for some time: Carrots, parsnips, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohlrabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

Flower Garden.—All the roses should have been pruned some time ago, but do not forget to look them over occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragon), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberose, amaryllis, panceratium, ismene, erinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall was 2.63 inches, and for September 2.07 inches, increasing gradually to a rainfall of 7.69 inches in February.

Orchard Notes for August.

THE SOUTHERN COAST DISTRICTS.

The remarks that have appeared in these notes during the last few months respecting the handling and marketing of citrus fruits apply equally to the present month. The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the spring growth. All heavy pruning should be completed previous to the rise in the sap; and where winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with the lime and sulphur wash.

Where there are inferior sorts of seedling citrus trees growing, it is advisable to head same hard back, leaving only the main trunk and four or five well-balanced main branches cut off at about 2 ft. from the trunk. When cut back, give a good dressing with the lime and sulphur wash. Trees so treated may either be grafted with good varieties towards the end of the month or early in September; or, if wished, they may be allowed to throw out a number of shoots, which should be thinned out to form a well-balanced head, and when large enough should be budded with the desired variety.

Grafting of young stock in nursery, not only citrus but most kinds of deciduous fruits, can be done this month. It comes in useful in the case of stocks that have missed in budding, but for good, clean-grown stocks budding is to be preferred.

In the case of working our Seville orange stocks to sweet oranges, grafting is, however, preferable to budding, as the latter method of propagation is frequently a failure. The Seville stock should be cut off at or a little below the surface of the ground. If of small size, a single tongue graft will be sufficient; but if of large size, then the best method is the side graft—two or more grafts being placed in each stock, so as to be certain of one taking. In either case the grafts are tied firmly in place, and the soil should be brought round the graft as high as the top bud. If this is done, there will be few missed, and undesirable Seville stocks can be converted into sweet oranges.

In selecting wood for grafting, take that of the last season's growth that has good full buds and that is well matured; avoid extra strong or any poor growths.

Seville oranges make good stocks for lemons. In case it is desirable to work them on to lemons, it is not necessary to graft below ground, as in the case of the sweet orange, but the stock can be treated in the same manner as that recommended in the case of inferior oranges—viz., to head hard back, and bud on the young shoots.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the trees' use during spring. This is a very important matter, as spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop to a greater or less extent.

Where necessary, quickly acting manures can be applied now. In the case of orchards, they should be distributed broadcast over the land, and be harrowed or cultivated in; but in the case of pines they should be placed on each side of the row, and be worked well into the soil.

The marketing of pines, especially smooths, will occupy growers' attention, and where it is proposed to extend the plantations the ground should be got ready, so as to have it in the best possible condition for planting, as the thorough preparation of the land prior to planting pines is money very well spent.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the surface of the ground, instead of leaving 6 or 7 in. of the cutting out of the ground.

to dry out, as is often done. You only want one strong shoot from your cutting, and from this one shoot you can make any shaped vine you want. Just as the buds of the vines begin to swell, but before they burst, all varieties that are subject to black spot should be dressed with the sulphuric acid solution—viz., three-quarters of a pint of commercial sulphuric acid to one gallon of water; or, if preferred, this mixture can be used instead—viz., dissolve 5 lb. of sulphate of iron (pure copperas) in one gallon of water, and when dissolved add to it half a pint of sulphuric acid.

THE TROPICAL COAST DISTRICTS.

Bananas should be increasing in quality and quantity during the month, and though, as a rule, the fruit fly is not very bad at this time of the year, still it is advisable to take every care to keep it in check. No over-ripe fruit should be allowed to lie about in the gardens, and every care should be taken to keep the pest in check when there are only a few to deal with, as, if this is done, it will reduce the numbers of the pest materially later on in the season. The spring crop of oranges and mandarins will be now ready for marketing in the Cardwell, Tully, Cairns, and Port Douglas districts. For shipping South see that the fruit is thoroughly sweated, as unless the moisture is got rid of out of the skins the fruit will not carry. Should the skins be very full of moisture, then it will be advisable to lay the fruit on boards or slabs in the sun to dry; or, if this is not possible, then the skin of the fruit should be artificially dried by placing same in a hot chamber, as the moisture that is in the skin of our Northern-grown citrus fruits must be got rid of before they will carry properly.

Papaws and granadillas should be shipped South, and the markets tested. If carefully packed in cases holding only one layer of fruit, and sent by cold storage, these fruits should reach their destination in good order. Cucumber and tomato shipments will be in full swing from Bowen. Take care to send nothing but the best fruit, and don't pack the tomatoes in too big cases, as tomatoes always sell on their appearance and quality.

THE SOUTHERN AND CENTRAL TABLELANDS.

All fruit-tree pruning should be finished during the month, and all trees should receive their winter spraying of the lime and sulphur wash.

All new planting should be completed, orchards should be ploughed and worked down fine, and everything got ready for spring.

In the warmer parts, grape pruning should be completed, and the vines should receive the winter dressing for black spot. In the Stanthorpe district grape pruning should be delayed as late as possible, so as to keep the vines back, as it is not early but late grapes that are wanted, and the later you can keep your vines back the better chance they have of escaping spring frosts.

Towards the end of the month inferior varieties of apples, pears, plums, &c., should be worked out with more desirable kinds; side, tongue, or cleft grafting being used. In the case of peaches, almonds, or nectarines, head back and work out by budding on the young growth.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
	6.13	5.17	6.30	5.0	6.39	5.3	6.30	5.18	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
	6.14	5.16	6.30	5.0	6.39	5.3	6.30	5.18	
3	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	4 May ☾ Last Quarter 8 26 a.m.
4	6.15	5.14	6.31	5.0	6.39	5.4	6.29	5.19	10 " ● New Moon 11 1 p.m.
5	6.15	5.13	6.32	5.0	6.39	5.4	6.28	5.20	18 " ☾ First Quarter 6 14 a.m.
6	6.16	5.13	6.32	5.0	6.39	5.5	6.27	5.20	26 " ○ Full Moon 8 32 a.m.
7	6.16	5.12	6.33	5.0	6.39	5.5	6.27	5.21	The Moon will be nearest the earth on the 8th, and farthest from it on the 20th.
8	6.17	5.11	6.33	5.0	6.39	5.6	6.26	5.21	
9	6.17	5.11	6.34	5.0	6.39	5.6	6.25	5.22	2 June ☾ Last Quarter 2 20 p.m.
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.22	9 " ● New Moon 8 3 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23	16 " ☾ First Quarter 11 12 p.m.
12	6.19	5.9	6.35	4.59	6.39	5.8	6.22	5.24	24 " ○ Full Moon 8 38 p.m.
13	6.20	5.8	6.36	4.59	6.38	5.8	6.21	5.24	The Moon will be nearest the earth on the 5th, and farthest from it on the 17th. It will be 12 times its diam. north of the planet Uranus on the 1st at 7.30 p.m.
14	6.20	5.8	6.36	4.59	6.38	5.9	6.20	5.25	There will be a very partial Eclipse of the Moon on the 24th June, commencing about 7.46 p.m. and ending about 9.10 p.m.
15	6.21	5.7	6.36	5.0	6.38	5.9	6.19	5.26	
16	6.21	5.6	6.37	5.0	6.38	5.10	6.19	5.26	
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.27	
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	
19	6.23	5.5	6.38	5.0	6.37	5.11	6.16	5.28	1 July ☾ Last Quarter 6 43 p.m.
20	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28	8 " ● New Moon 6 22 p.m.
21	6.24	5.4	6.38	5.1	6.36	5.12	6.14	5.29	16 " ☾ First Quarter 4 25 p.m.
22	6.25	5.3	6.39	5.1	6.36	5.13	6.13	5.29	24 " ○ Full Moon 6 35 a.m.
23	6.25	5.3	6.39	5.1	6.35	5.13	6.12	5.30	30 " ☾ Last Quarter 10 14 p.m.
24	6.26	5.3	6.39	5.1	6.35	5.14	6.11	5.30	The Moon will be farthest from the earth on the 15th, and nearest on the 27th.
25	6.26	5.2	6.39	5.1	6.34	5.14	6.10	5.30	
26	6.27	5.2	6.39	5.2	6.34	5.15	6.9	5.31	7 Aug. ● New Moon 6 30 a.m.
27	6.27	5.2	6.39	5.2	6.33	5.15	6.8	5.31	15 " ☾ First Quarter 8 16 a.m.
28	6.28	5.1	6.39	5.2	6.33	5.16	6.7	5.32	22 " ○ Full Moon 3 2 p.m.
29	6.28	5.1	6.39	5.2	6.32	5.16	6.6	5.32	29 " ☾ Last Quarter 5 27 a.m.
30	6.29	5.1	6.39	5.3	6.32	5.17	6.5	5.33	The Moon will be farthest from the earth on the 12th, and nearest to it on the 24th.
31	6.29	5.0	...	...	6.31	5.17	6.4	5.33	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during May, June, and July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

QUEENSLAND AGRICULTURAL JOURNAL

VOL. X.

AUGUST, 1918.

PART 2.

Agriculture.

THE AUSTRALIAN WHEAT YIELD FOR 1917-18.

The Australian wheat yield for 1917-18 has been estimated at 116,058,315 bushels, of which New South Wales has produced 37,842,930 bushels; Victoria, 37,737,552 bushels; South Australia, 28,692,594 bushels; Western Australia, 10,000,000 bushels; Queensland, 1,405,664 bushels; Tasmania, 379,575 bushels. Of the Australian 1915-16 crop there are 6,708,000 bushels held by shippers and 267,000 bushels by millers. Of the 1916-17 crop, shippers hold 93,933,000 bushels, and millers 3,309,000 bushels. Of the 1917-18 crop, shippers hold 82,941,000 bushels, and millers 12,807,000 bushels. Not allowing for that destroyed by mice and weevil, there should be now in Australia 66,655,000 bags, or in round figures 200,000,000 bushels of wheat, which, at only 4s. per bushel, would be worth £40,000,000. If it could be shipped it would be worth very much more. On 3rd June the Australian Wheat Board had an overdraft of £10,763,000. Of this the New South Wales amount was £3,249,000; that of Victoria, £3,597,000; South Australia, £3,399,000; Western Australia, £518,000.

On the 30th May a cargo of about 2,200 tons of wheat in the schooner Betsy Ross left Melbourne for the United States. This vessel is the first to sail of the fleet of American and Canadian sailing vessels, detained in Melbourne pending the completion of negotiations with regard to the carriage of Australian wheat to the United States.—Producers' Agency.

CULTIVATION OF LINSEED FOR OIL PRODUCTION.

The following facts have been collected by Messrs. Meggitt Limited, Sydney (whose advertisement *re* linseed meal, &c., appears in another page of this issue of the "Journal"), with a view of helping farmers in the production of linseed for oil milling. The production of flax entails a different treatment, and is entirely another proposition.

Linseed is grown extensively in Argentine, Canada, India, America, and Russia. It may be argued that linseed might do well in the above countries, and yet prove an unsatisfactory enterprise in Australia. So far as we can ascertain, there does not appear to be any reason why linseed should not do well and prove at least as profitable as wheat in the greater part of the country which is now chiefly occupied in production of that cereal.

All the countries which produce linseed in any quantity are also great wheat-producing countries. Although it may be argued that the demand for linseed would be purely local, it must be apparent to thinking people that there is just as wide a world market for linseed as there is for wheat. Our requirements will approximate 18,000 tons per year.

In 1913 the gross linseed imports into the United Kingdom for twelve months to 31st December, were 3,274,000 quarters, and the total American imports of linseed (official) for 1914, 1915, and 1916, respectively, were 231,163 tons, 370,909 tons, and 327,451 tons.

There is no area in the United States in which flax is grown as a dual purpose crop—that is, producing both linseed and flax. Practically all the area is devoted to the production of seed alone. Straw from some areas is utilised in the manufacture of tow, which is used in the making of upholstery tow, insulation boards, certain types of rugs, and, to some extent, in the making of coarse papers. Just at the present time it is being utilised principally, we believe, in the manufacture of oakum.

SOIL.

Any land that will grow wheat, oats, and like crops will grow linseed. Avoid boggy, wet land; don't use rich land—soil well cropped out will give good results. Grown as a rotation crop once in about seven, it will do the soil a lot of good, and the land will grow better crops after it. When grown upon sandy soils the difficulty is that the crop is too dependent upon frequent rainfall for the necessary moisture, since there is so little available water stored in such a soil.

PLOUGHING.

Plough to the depth of about 7 inches, then work the soil to a fine tilth, making the surface smooth and even.

SOWING.

Sow broadcast. This can be done effectively with the drill by taking off the points and fixing a board under the cups; the seed dropping on the board is cattered evenly over the ground. Slant the board to throw from the machine to the back.

There appears to be a diversity of opinion as to the quantity of seed to be sown per acre. The Department of Agriculture of New South Wales advise 30 lb. to 40 lb. per acre, whereas the "Farmers' Bulletin," published by the United States, America, Department of Agriculture, say to sow from 15 to 35 lb. to the acre; again, a local authority says about 56 lb. of seed to the acre should be sown. The seed should be

lightly rolled to a depth of between half an inch to one inch. The seed should be sown as early in Spring as land is prepared, before the surface dries. Before the seed is finally selected for planting it should be thoroughly cleaned, and all foreign seeds, or immature seeds, should be graded out, using only the plump seed.

DISINFECTING.

In order to insure against infecting the soil with disease organisms, which later might injure or destroy the growing plants, the seed intended for planting should be given formaldehyde treatment. This treatment consists of spreading the seed on a tight floor and spraying it with a solution made in the proportion of one pint of 40 per cent. formaldehyde to 40 gallons of water. The best results can be accomplished by using a spraying outfit which throws a fine misty spray. Then, by turning the seed with some such implement as a hoe or rake, the entire surface of the seeds should be covered with the solution. About two quarts of the spray material will be sufficient for each bushel of flax seed. While drying, the seed should be turned occasionally with a scoop shovel to prevent them from adhering to each other.

HARVESTING.

Cut with reaper and binder close to the ground, stack to dry, then stack some time before thrashing. The time to harvest is when the top seed bolls turn brown and about half-way up of the straw has turned yellow.

Without any available data to go upon, it is impossible to say what crop of seed is likely to be produced in Australia, but it should be certainly on the same ratio as wheat—namely, from 10 to 20 bushels to the acre (56 lb. to the bushel).

As regards the price likely to be secured for the crop, this is at present impossible to forecast. In the near future the rate will be a high one, and probably in the neighbourhood of 6s. to 10s. per bushel. Conditions prevalent preclude any definite information in this connection. Freights are fluctuating almost daily.

Mr. George Suttor (one of the noted wheat experts of the State) says:—"Linseed is a crop likely to prove very suitable as a rotation crop in the majority of our wheat districts. Its cultivation is almost identical with that of wheat." Mr. Suttor added that this crop matures more quickly than wheat, and one great advantage is that it can be left in the paddock unharvested several weeks without risk of loss from shedding.

[In connection with the above, Messrs. Meggitt, who are largely engaged in the production of linseed oil in New South Wales, state that they are in a position to guarantee a market for at least 10,000 tons per annum, and, as their output is daily increasing, these figures would, in all probability, be considerably augmented before very long. We have frequently advised the growing of the flax plant both for fibre and seed, as a crop likely to give good returns, and the exigencies of the war would doubtless cause a rise in the price of linseed oil and flax, and consequently the farmer would benefit by such an increase in price.—Ed. "Q.A.J."]

SORGHUMS FOR SALE.

In continuation of the series of illustrations of the sorghum, seed of which is obtainable from the Department of Agriculture and Stock (*vide* advertisement in this issue of the journal), we now depict the following varieties:—Dwarf Milo, Shantung Dwarf Milo, Valley Kaoliang.

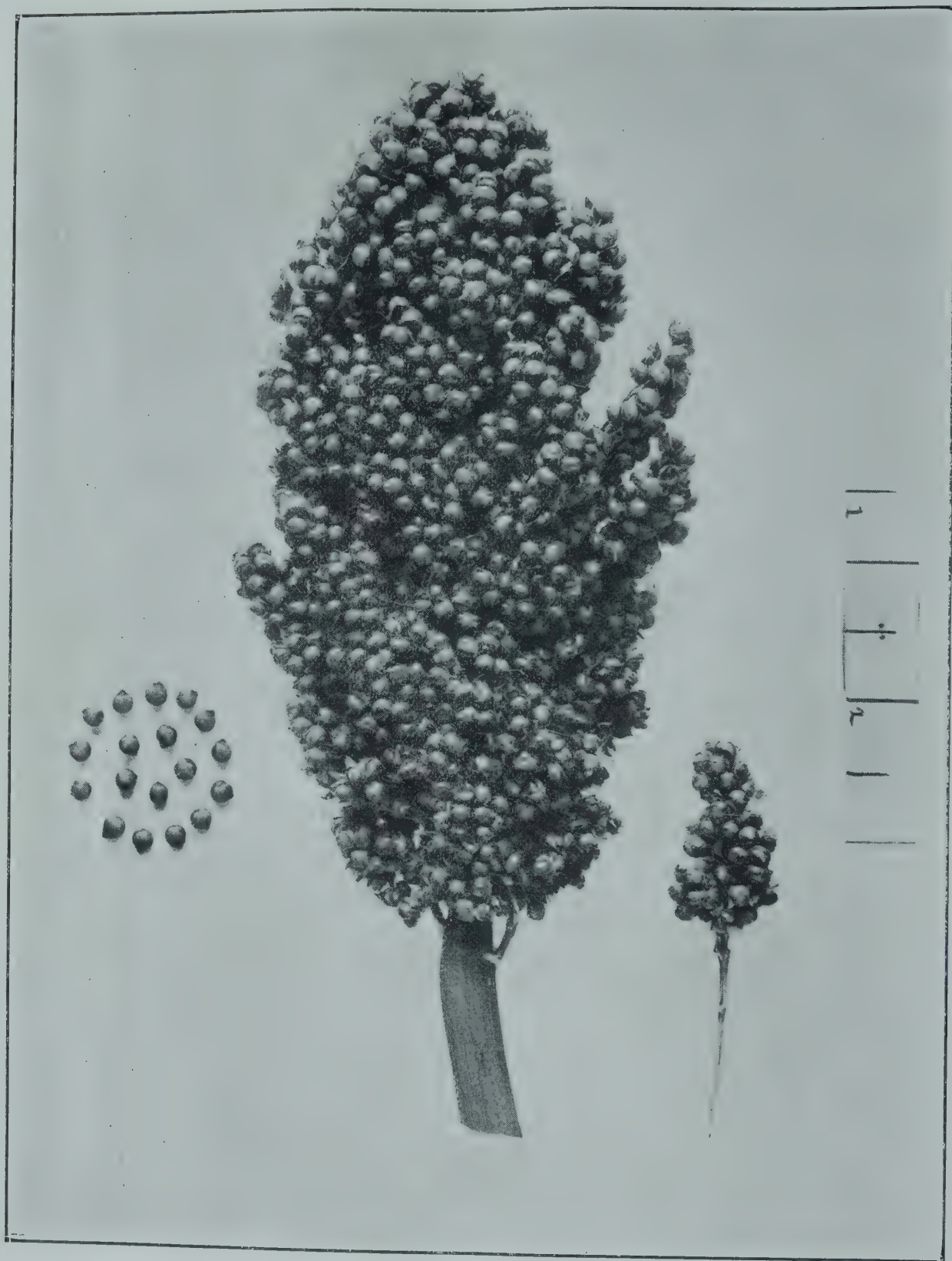


PLATE 9.—DWARF MILO.

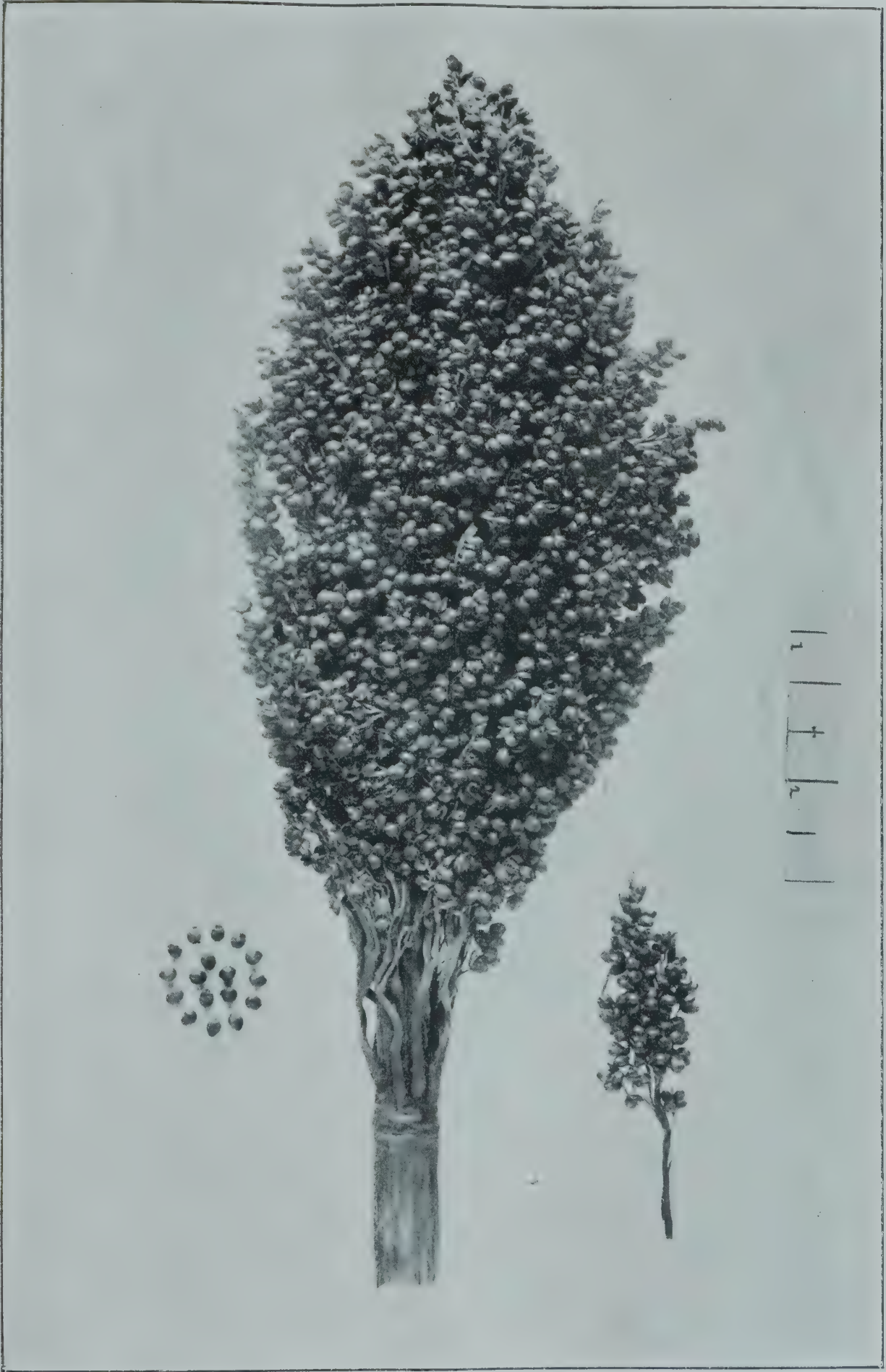


PLATE 10.—SHANTUNG DWARF KAOLIANG.

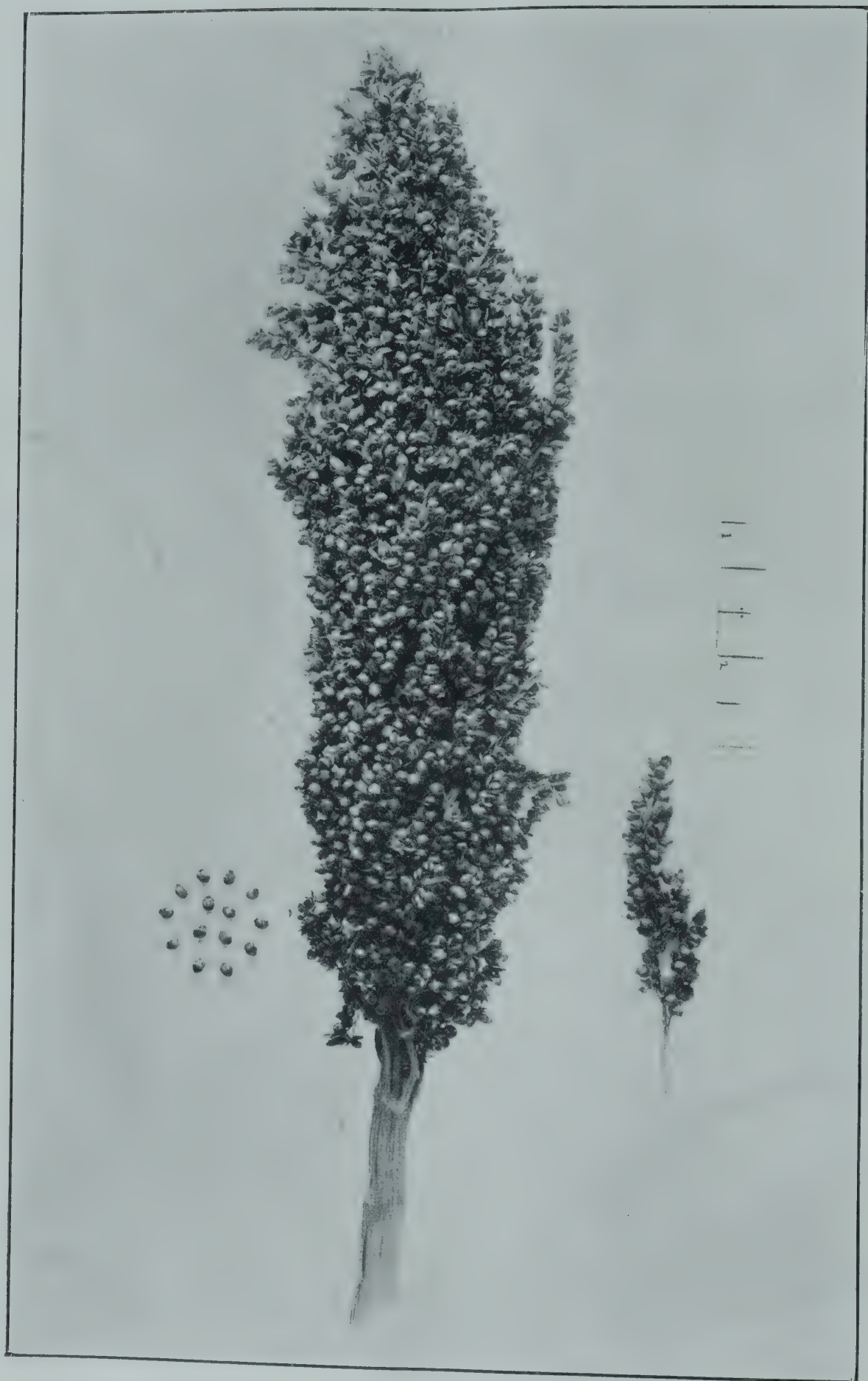


PLATE 11.—VALLEY KAOLIANG.

BROOM MILLET.

"In June last" (says "Town and Country"), "Northern River and inland broom millet fetched up to £100 a ton, which was easily a record for Sussex Street. The shortage was mainly due to floods washing away many of the first and second sowings along the Richmond and sister rivers. The Federal Price Fixing Commissioner was to hold an inquiry during the month, with a view to fixing a maximum rate for this staple line."

Such a price is, no doubt, the maximum for the best fibre. It would certainly prove a most profitable crop for Queensland farmers, and they would do well to take advantage of the opportunity offered by the Department of Agriculture and Stock to enable them to obtain seed of the very best varieties of broom millet. As notified in our advertising pages, seeds of sorghum and millet may be obtained on application to the Under Secretary for Agriculture. Postage packets, orders of not less than 3 lb. of any one variety, will be supplied. Three sizes are made up, viz.:—3 lb. for 2s. 6d.; 7 lb. for 5s. 6d.; and 10 lb. for 7s. 6d. respectively (including weight of seed envelope).

THE GROWING OF LUCERNE.

In the course of a most interesting address delivered before the Conference of Mid-Northern Branches of the Agricultural Bureau by the Director of Agriculture, Professor Arthur J. Perkins, South Australia, the following advice was given to farmers:—

GENERAL ADAPTABILITY OF LUCERNE TO SOILS.

We often hear certain types of country referred to specially as "lucerne land"; particularly is this the case in some parts of the Lower North. I am afraid that assertions of this kind have, in the past, been very largely responsible for checking the spread of lucerne as a general farm crop. As a matter of fact, there are very few soils indeed on which lucerne is not likely to thrive; although one must admit that the total yields of this crop are more satisfactory in some soils than in others.

On the whole, so far as lucerne is concerned, the subsoil is probably of greater importance than the soil. Lucerne is an exceedingly deep-rooted plant; its roots have at times been traced to depths of 16 feet to 18 feet below the surface. We may take it, therefore, that, once established, lucerne lives chiefly in the subsoil; hence a favourable subsoil is of greater importance than a favourable soil. The best type of subsoil is a good natural drainage. A stiff subsoil, exposed to lying wet over a long period of time, is always to be avoided; and the same may be said of a rocky unfissured subsoil. In other words, therefore, lucerne requires a type of subsoil into which its long roots are able to penetrate without difficulty.

We cannot, however, altogether overlook the quality and character of the surface soil, since consistently heavy yields are obtainable only when comparatively fertile surface soil of good depth covers a favourable subsoil. In this connection, rich alluvial lands are undoubtedly the best, and should always be selected when available. I must again insist that for the healthy development of lucerne, the presence of a sufficiency of lime in soil and subsoil is an essential factor.

An underground watertable, relatively close to the surface, is often pointed to as a desirable factor in lucerne land. Whilst the value of this feature may be admitted in a general way, it is as well to point out that in certain circumstances it may not be without disadvantage. If, for instance, in these circumstances the height of the watertable is liable to vary with the season, and particularly to rise unduly in the winter months, it may prove more or less fatal to the lucerne plants. It cannot therefore be insisted upon too strongly that whatever the character of the soil, it is absolutely essential to the success of lucerne that the soil offer good natural drainage facilities, and that the plants be not exposed for any length of time to stagnant moisture.

Finally, it is not advisable to place lucerne on land in which salt is likely to accumulate to any extent under the influence of irrigation operations.

PREPARATION OF THE LAND.

When we set about preparing land for lucerne, we should always bear in mind that we are about to sow a crop which, we hope, will occupy the land for several

successive years; hence common sense indicates that we should give to this preparation of the land at least as much attention and care as would be bestowed upon a crop which is sown and reaped and finally disposed of in a single season.

The fact that lucerne is a very deep-rooted plant suggests that in preparing the land we should do everything towards facilitating the early descent of the roots into the subsoil; hence, for best possible results, land which is to carry lucerne should, from the outset, be subsoiled to a depth of 12 inches to 15 inches at least. The simplest plan for the purpose is, perhaps, to break up the land with an ordinary plough to a depth of, say, 6 inches to 8 inches, and immediately afterwards follow this work up with a subsoiler, which will stir up the subsoil to the requisite depth without, however, bringing it to the surface.

We must assume this subsoiling to take place at the time of the year best suited for work of this kind, probably in May or June in most districts. Subsequently to this first treatment, land which is to carry lucerne must be treated in exactly the same fashion as we should treat bare fallow intended for wheat in the following season. If this practice is carefully followed, the subsoil and the land generally, which have been roughly torn up and opened out to a considerable depth, will, under the influence of winter rains and of successive tillage operations, gradually run together again, and mellow down into a suitable type of seedbed, the surface of which should be as fine as an onion bed, and the layers immediately below firm and compact, like those of a well-prepared wheat field. Moreover, frequent tillage operations should have the effect of cleaning the land and freeing it from undesirable weeds.

I know that, relatively to what is done for wheat, there is a tendency to slur over the preparation of the land for forage crops; it is well, therefore, that we should convince ourselves that both yields and durability of the lucerne fields depend very largely on the care and attention we are able to bestow on this initial preparation on the land.

THE APPLICATION OF A DRESSING OF FARMYARD MANURE PRIOR TO SEEDING.

It has already been stated that lucerne thrives best in naturally fertile land; hence everything that we can do towards artificially raising the fertility of average land will contribute much towards a general improvement in future yields.

It is often stated that farmyard manure is essentially a nitrogenous manure, and that since the leguminous crops, of which lucerne is one, do not draw their nitrogen from the soil but from the atmosphere, they can benefit but little from a dressing of farmyard manure. Nevertheless, general experience does not support this view; indeed, quite the contrary would appear to be the case. We may account for the responsiveness of lucerne and other leguminous crops to dressings of farmyard manure to the fact that although they do not draw much nitrogen from the soil, for strong, successful growth they are always dependent on an abundance of organic matter, and for soils inadequately provided with the latter it is always to farmyard manure that the farmer naturally turns. Hence farmers who, as a rule, have no particular use for farmyard manure in their wheatfields should distribute it liberally over land which they intend bringing under lucerne. Any dressing up to 20 tons to the acre, or over, will not be excessive. This manure should be spread over the ground and ploughed under when the land is first broken up in the way of preparation for lucerne; it will thus have a full year to decompose in the soil before seeding operations come round. During this time, too, weeds, the seeds of which it brings with it, will germinate, and can be destroyed by ordinary tillage operations.

GRADING OF THE LAND FOR IRRIGATION PURPOSES.

It should be stated here that it is exceedingly unwise to endeavour to grow irrigated lucerne on land that has not been carefully graded. If grading is neglected, the usual result is that in a very short space of time portion of the land is liable to die out from excess of water, whilst the balance makes poor, weakly growth, because the irrigation waters fail to reach it. If irrigation by flooding is contemplated, the land must be graded to a fairly even level prior to seeding. If, on the other hand, sprinklers are to be availed of, a fall of 3 inches in the chain will always be found advantageous from the point of view of drainage.

IRRIGATION OF SOIL INTENDED TO CARRY LUCERNE.

It is to-day a matter of common knowledge that lucerne, like other leguminous crops, is able, through the medium of special bacteria living on its roots, to abstract free nitrogen from the atmosphere. Moreover, it has frequently been stated that on land on which lucerne has not been grown previously these essential bacteria are at times absent, and that when this is the case, lucerne never makes satisfactory growth. So far as my experience goes, this is very rarely the case in South Australia; and we are almost justified in the view that with us, at all events, these special bacteria are

more or less ubiquitous. It would appear, however, to be comparatively easy to overcome the difficulty in those cases in which direct experience had shown that these bacteria were absent. All that it would be necessary to do would be to secure suitable quantities of soil from a well-established lucerne field in a neighbouring district. This soil, which should not be allowed to dry out unduly, should then be drilled over the land immediately prior to seeding at the rate of 2 cwt. to 3 cwt. to the acre. Hitherto, however, there appears to have been no need for the adoption of this practice in South Australia.

SOWING PERIODS FOR LUCERNE.

When should lucerne be sown? In reply to this question, we find advocates for two seasons, some preferring the spring and others, again, the autumn. Now, whilst I readily recognise that in very cold countries—countries, in fact, in which lucerne is not as a rule currently grown—spring sowing has distinct advantages, from the point of view of personal experience, I am convinced that autumn sowing is in every way better adapted to general South Australian conditions. So far as I am able to judge, the only advantage that can be claimed for spring sowing is that the young seedling plants are less exposed to damage by frost than when sown in autumn. Such an advantage unquestionably holds good in those countries in which winter frosts are of exceptional severity. Under our conditions, however, it has, in my opinion, little or no significance; hence, in dealing with seeding operations, I shall assume that we have in view autumn seeding alone. Moreover, should severe frost happen occasionally to destroy autumn-sown lucerne, it always remains open to us to sow again the whole field, or such portions of it as have been damaged, as soon as spring opens.

I think it worth while to draw attention to one of the chief advantages that can be claimed for autumn sowing of lucerne. Autumn-sown plants have ample time to penetrate into the depths of the soil before the hot weather sets in; hence, in the summer that immediately follows seeding operations, autumn-sown plants are infinitely stronger and healthier than those sown in spring, and one of the immediate consequences of this fact is that whilst the cuts of the first year from a spring-sown crop are relatively light, the total cuts from an autumn-sown crop of the first year frequently almost equal in weight the cuts of the second year. This, it will be agreed is, from the pecuniary point of view, a very appreciable advantage in favour of autumn sowing.

Attention should, perhaps, be drawn to an objection that is frequently raised to autumn sowing. It is said—and with reason—that an autumn-sown crop is very often more or less smothered by winter-growing weeds. I shall point out, in the first place, that this difficulty would be very much minimised if, as I have suggested, the land which is to be sown to lucerne had been carefully bare fallowed in the previous season. Nevertheless, I agree that, in spite of careful fallowing, we cannot altogether avoid the development of a certain amount of winter weed growth. I must state, however, that in my personal experience, these winter weeds are comparatively innocuous from the lucerne's point of view; indeed, at times the stronger weeds may even act as shelter against frost to the more slow-growing lucerne plants. Let us admit that by August there will often seem to be more weeds than lucerne plants. It is wise, at this stage, to take an early cut of lucerne and weeds, providing always the land is sufficiently dry on the surface to admit of it. Subsequently, under the influence of rising temperatures, the second growth will make rapid progress, and the second cut, still more or less seedy, should follow as soon as possible; in September, if circumstances admit of it. Thereafter, throughout the summer months, I can guarantee that not a weed will be found in a well-sown field of lucerne; and this could hardly be said of spring-sown lucerne, which in the first year is generally apt to be overrun with strong-growing summer weeds, such as hogweed, &c.

THE USES OF A COVERING CROP FOR LUCERNE.

The sowing of a sheltering or covering crop simultaneously with lucerne is frequently recommended. The chief object aimed at would appear to be to occupy the land more profitably in the first season than could be done with lucerne alone. With this object in view, rye-grass, rye, and even barley or oats are sometimes sown with lucerne seed. It cannot be said that this practice is of any particular advantage to the lucerne plants themselves; indeed, I am of the opinion that it detracts from the eventual returns of the yield by hindering early growth. When lucerne is autumn-sown, I can see absolutely no advantage in adopting this practice; hence in no circumstances can I recommend it.

WHEN TO PRACTICE AUTUMN SOWING.

Assuming that the practice of autumn sowing is recognised as best suited to local conditions, it remains for us to determine what particular time in the autumn months is best adapted to the sowing of lucerne.

In principle it is of advantage that the young plants should be above ground as early in autumn as circumstances permit of. In the early autumn the ground is still

warm, and given a sufficiency of moisture, the young plants will take very ready advantage of it; hence, if we have irrigation facilities at our disposal, I recommend sowing towards the end of March. If, on the other hand, we have to trust to rain to bring up the seed, we should generally sow on the first break in the season. Should autumn rains hold off unduly, I would not hesitate to sow dry and trust to the first rain to bring up the seed.

DRESSING OF SUPERPHOSPHATE PRIOR TO SEEDING.

Notwithstanding an earlier dressing of farmyard manure, it is always advisable, in our type of soils, to drill in from 2 cwt. to 4 cwt. of superphosphate to the acre immediately prior to seeding.

[TO BE CONTINUED.]

AGRICULTURAL RESEARCH IN AUSTRALIA.

We are in receipt of Bulletin No. 7, entitled "Agricultural Research in Australia," issued by the Commonwealth Advisory Council of Science and Industry. In it are published the various papers read at a conference of agricultural scientists from all the States of the Commonwealth, which was held in Melbourne in November, 1917. In addition, the Bulletin publishes interesting summaries of the discussions on the various papers read, and the resolutions which were proposed at the earlier sessions of the conference which were then carried provisionally, and were finally adopted at the last session. The papers read covered a wide scope of research, including the breeding of cereals, immunity, inheritance, and acclimatisation of plants, the tobacco and fibre-growing industries in Australia, the utilisation of the phosphate deposits of Australia, the Australian sugar industry, and suggestions as to the Commonwealth endowment of agricultural research. As regards fibre-growing, a most interesting paper was read by Mr. T. Hogg, a few extracts from which will be found in another part of this journal, as being of especial interest to farmers and manufacturers in this State.

An attempt was made to initiate the cultivation of New Zealand hemp; but, although the plant does well here, no success attended the efforts made to establish plantations of this valuable fibre plant. Flax has also been tried, and, as a winter crop, thrived well, but when it came to the labour question, Queensland farmers could not compete with Russia. Mr. Hogg very rightly urges Australian agriculturists to grow flax, pointing out that Australia might some day be so isolated that she could not import anything. Still, the labour question stands in the way of any fibre industry being profitably carried on here. It may be noted that with the exception of a kind of tall-growing flax in Italy, flax grown in Russia, and New Zealand flax, all our supplies of useful fibres are imported from countries where cheap black labour is employed. Hence all attempts to grow fibre plants to a profit with white labour meet with disaster.

THE POSSIBILITY OF CULTIVATING FIBRE PLANTS IN AUSTRALIA.

In the course of Mr. Hogg's remarks on the above subject, in the paper read by him at the fifth session of the Advisory Council of Science and Industry held in Melbourne on the 15th November, 1917, the question of the cultivation of fibre plants in Australia was dealt with from a business point of view by a business man. This is precisely the information which should be of much interest to capitalists and to all engaged in agricultural pursuits in Queensland. We have persistently advocated the cultivation of sisal hemp, Mauritius hemp, Sausiviera (Murva), and flax in Queensland, all of which thrive well. A few years ago the sisal agave was very profitably grown both in the South, North, and in the Burnett district at Childers, but owing to the constantly increasing wages of farm labourers, and the cost of machinery, the industry gradually died out. Mauritius hemp, the product of *Eurerea gigantea*, was never cultivated here, although it thrives well even in frosty districts, the leaves attaining a length of from 7 to 8 ft. In former times, when sisal hemp was worth £24 per ton in Australia, some planters made a clear profit of £12 per ton. Yet the industry died out, and there seems no probability of its revival. Sisal fibre is worth £100 per ton since the war, but even if there were any supplies available in Queensland, no advantage could be taken of the great rise in price, owing to want of transport facilities. The only market would be limited to the requirements of Australian ropemakers, which are too restricted in their operations to warrant the erection of expensive machinery. A considerable quantity of the fibre is produced in Papua, especially on one large well-equipped plantation at Tavai. But in Papua there is a plentiful supply of black labour, and the natives soon become experts at working the machinery.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FROM 30TH MAY TO 29TH JUNE, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Melba ...	Holstein ...	31 Mar., 1918	1,208	4.1	58.04	
Buttercup ...	Shorthorn ..	30 May „	1,058	4.6	57.34	
Royal Mistress ...	Ayrshire ...	13 Mar. „	658	5.9	45.95	
Dawn of Warragaburra	Jersey ...	4 May „	658	5.2	40.41	
Miss Betty ...	„ ...	9 June „	632	5.3	39.52	
Constancy ..	Ayrshire ...	7 April „	667	5.0	37.65	
Charming Damsel	„ ...	1 May „	735	4.1	33.70	
Lady Margaret ...	„ ...	27 Dec., 1917	493	5.4	30.87	
Lady Peggy ...	„ ...	30 Mar., 1818	710	3.9	30.50	
Yarraview Ida's Hope	Guernsey ...	5 May „	577	4.0	25.78	
Iron Plate ...	Jersey ...	14 Oct., 1917	311	6.9	25.46	
Jeannie ...	Ayrshire ...	13 Dec. „	339	6.2	24.89	
Leda's Jessie ...	Jersey ...	25 Mar., 1918	390	5.3	24.42	
Mistress Bee ...	„ ...	23 Jan. „	420	4.9	24.27	
Leading Lady ...	„ ...	26 Dec., 1917	333	5.9	23.35	
Hedge's Nattie ...	Holstein ...	1 Feb., 1918	519	4.0	23.20	
Lady Loch II. ...	Ayrshire ...	13 June „	382	4.9	22.07	
Charity ...	Jersey ...	24 April „	376	5.0	21.22	
College Ma Petite	„ ...	10 Nov., 1917	291	6.1	21.02	
Princess Kate ...	Ayrshire ...	5 May, 1918	449	3.9	20.54	
Glow VI. ...	Guernsey ...	9 Nov., 1917	375	4.8	20.28	

TREATMENT FOR DOGS, FOALS, AND CALVES AFFECTED WITH SCRUB TICK.

Scrub ticks cause a great deal of trouble to stockowners in certain districts with a large percentage of mortalities. It has been stated that these ticks do not harm the animals during the first four days of attachment, so it is recommended that, where scrub ticks are prevalent, valuable animals should be thoroughly examined every second or third day. It has been proved that trypan blue, injected under the skin, is a specific for this disease in the dog. The paralysis soon improves, and in a few days the animal thoroughly recovers. One dose of the trypan blue is usually sufficient. A $2\frac{1}{2}$ per cent. solution (about 9 grains to a fluid ounce of water) is made by dissolving the blue in boiling water. A sediment falls as the solution cools, and this should be removed by filtering through a funnel, in which a properly folded filter is placed, or a piece of clean linen which has been previously boiled. The hypodermic syringe and needle, before being used, should be placed in a dish containing cold water, then placed over the fire, and the water boiled for about ten minutes. This thoroughly sterilises the syringe and needle, which are now ready to use when the solution to be injected has cooled. The injection can be made anywhere under the skin, but the best positions are either in front of the chest or behind the shoulder, the skin in these positions being loose, and a fold can easily be caught up by the finger of the left hand, whilst the needle is inserted with the right hand. It is advisable to clip off the hair and disinfect the spot chosen before introducing the needle. A dose for dogs, according to age and size, varies from 1 to 5 drachms, or 1 to 5 teaspoonsful; the dose for calves and foals, according to age and size, from $\frac{1}{2}$ oz. to $2\frac{1}{2}$ oz., or 1 to 5 tablespoonsful.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Books is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	10	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.		Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS—continued.					
GUERNSEYS.					
Queensland Agricultural College	Gatton	.. ..	2	2	Eligible, but no Guernsey Herd Book of Australia
HOLSTEINS.					
Queensland Agricultural College	Gatton	.. ..	2	9	Holstein-Friesian Herd Book of Australia
George Newman	..	“St. Athan,” Wyreema	12	47	Do.
F. G. C. Gratton	..	“Fowlerton,” Kingsthorpe	1	15	Do.
R. S. Alexander	..	Glenlomonad Farm, Coolumboola	1	3	Do.
Ditto	..	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand.
S. H. Hoskings	..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff	..	Inavale Stud Farm, Bunjgurgun, Q.	3	9	Do.
E. Swayne	..	West Plane Creek, Mackay	1	2	Do.
ILLAWARRA.					
A. Pickels	..	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son		Corndale, Coolabunia	3	43	Do.
W. T. Savage	..	Ramsay	2	22	Do.
Hunt Bros.	..	Springdale, Maleny..	3	62	Do.
MILKING SHORTHORNS.					
P. Young	..	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	..	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	..	Torran’s Vale, Lane-field	1	9	Do.
W. Middleton	..	Devon Court, Crow’s Nest	3	27	Do.
A. K. Yorksten	..	“Dunure,” Miles ..	2	8	Do.
BEEF BREEDS.					
SHORTHORNS.					
T. B. Murray-Prior	..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall	..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan	..	“Arubial,” Condamine	3	6	Do.
W. B. Slade	..	E. Glengallan, Warwick	2	20	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS—<i>continued.</i>				
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

RE IRON ORES, AND BACTERIA IN STOCK.

By L. G. JONES.

On the authority of Mr. Emile Gautier there are fourteen substances that nourish all plant and animal life without destruction. Ten of these substances have exactly the composition of an iron ore. (See February issue of this Journal.) The other four are drawn from the air, and are carbon, oxygen, hydrogen, and nitrogen. The differences of form are the result of a variety of combinations of these primary substances that may be compared to the combinations of the twenty-six letters of the alphabet forming a variety of words. It is these elementary substances that worms, parasites, and depredatory bacteria draw from the animal's food or blood that which causes the animal to become anæmic. Extract from the "Live Stock Journal": "The fourth constituent of food consists of the mineral salts, which include phosphoric acid, soda, potash, and lime. Although these foods are minute in quantity, they are just as essential to the health of the animal as either of those already named (starch, &c.). Let us take a simple example. As bones are chiefly constructed of phosphate of lime, it follows that if the milk supplied to a calf were deprived of these mineral salts before it was consumed no bones would be built, and the calf would not only fail to grow but fail to live." It is in this manner that worms, ticks, fluke, and other parasites in stock act by removing from the food and blood the mineral salts, such as phosphoric acid, iron, soda, potash, lime, &c. The ticks emit a secretion that undoes the chemistry of the blood and enables them to extract the mineral properties therefrom, that which they require and thrive upon, and when this goes on to a sufficient extent, the animal becomes anæmic and dies, or becomes a suitable developing medium for depredatory bacteria which find a lodgment in the emaciated body. It is not necessary to administer powerful medicines to kill parasites or microbes. It is quite evident that there are useful as well as depredatory and vicious bacteria, and there is reasonable evidence that the useful kinds are as valuable in the economy of Nature as the baser variety are destructive to animal life. It is more than probable that the kindly bacteria wage a war of extermination against those of the baser sort, and under the favourable conditions of the iron ore and mispickel treatment would overcome and destroy them. It is self-evident that the true and rational way to get rid of objectionable bacteria is not to take strong and poisonous medicines to kill them, and thereby kill your bacterial friends as well as your parasitical and bacterial enemies, but to use such remedies as will restore the blood, fortify the nervous system, and thereby starve out the baser bacteria that depend for their existence upon blood impurity and want of nervous vitality. There is no excuse for giving strong medicines to kill parasites or anything of a bacterial nature, for the restoration of the health and purity of the intestinal secretions will starve them out. It is not necessary to resort to heroic measures except in very exceptional cases. Most bacteriologists of note hold that bacteria of the useful variety are employed to assist digestion, and, seeing that good digestion depends in a measure upon the operations of these microscopic creatures, it is manifestly bad practice to administer medicines of sufficient strength to kill microbes. The days for heroic treatment have gone by.

The Horse.

IN-BREEDING—THE CASE OF THE CLYDESDALE.

Writing in the "Scottish Farmer" on the above question, replying to the unanswered question of a correspondent—what will the in-and-in breeding of Clydesdales, which is getting common, lead to?—Mr. James A. Reid, of Airdrie, the Scottish lawyer, whose name is a household word in collie circles, says:—

"Is there any reason for silence? The more or less certain results of such breeding in our other domestic animals are to be found in their histories and the extensive literature of the subject generally; but, so far as I know, no authoritative article of any kind has ever appeared in Clydesdale literature. The following paragraph, however, appeared in 'The Scottish Farmer' of 2nd September, 1916:—'In-breeding is very apparent in the modern Clydesdale. A breeder of some eminence, in a private letter to the writer, bewails its prevalence and its full effects. He maintains that it has something to do with the high death-rate among foals and the increasing difficulty of rearing the foals which survive. That there is a deal of sameness in the composition of the breeding of many fashionable horses and mares is undoubted; yet it is questionable whether there is much in-breeding in the sense of breeding which in the human family would be denounced as incestuous. In-breeding as practised by the early Shorthorn improvers was of this nature. It was by resorting to it that Mr. Christopher Wilson achieved phenomenal results in pony breeding, but not much of the kind of mating which proved so successful in these cases is to be found in the modern Clydesdale. More harm has been done by breeding from unsound horses. Those having knowledge of important back crosses in the pedigree of some very notable animals have legitimate fears as to the future of their descendants. Nevertheless, there is point in the criticism of the correspondent referred to. It was a dictum of the late Lawrence Drew that in-breeding ought always to be avoided with the draught horse.

"No problem of animal breeding has given rise to more controversy than that of in-and-in breeding—*i.e.*, in-breeding in the most intensive sense of the term. From the days of Bakewell onwards there has been a wide difference of opinion as to the place which should be assigned to it in the experience of the ordinary breeder. Some have regarded it as altogether helpful, and others as altogether harmful. Because of this extreme difference in view the question has been much discussed in the agricultural Press, and frequently to but little purpose. Can anyone with a competent knowledge of the problem generally deal with it closely in its application to Clydesdale breeding? Can he tell us whether close-breeding in the fullest sense of the term is or is not 'very common,' and, if so, whether it can be said with any certainty that the practice has led and is leading to retrogression in the breed, as is commonly alleged? The sooner the question is faced the better in the interests of the breed and of breeders, who never had more reason to be alive to the future than they have now. When the facts are satisfactorily ascertained we shall see what conclusions (if any) can reasonably be drawn from them, having regard to other factors in the problem."

In an article on the above subject, the "New Zealand Farmer" for June, 1918, says:—

"What conflicting views are expressed on this great principle! On the one hand, we have the striking fact that the greatest breeders the world has seen owed their success to the principle, and, on the other hand, we have so-called authorities declaring that it leads to deterioration of type, sterility, and is the greatest danger besetting the work of live stock advancement. The main fact to remember is that the men who made such good use of in-breeding knew what they were doing. They realised that they were working with a two-edged weapon, and while it was powerful for good it was potent for evil. Rightly used, it was the most important of all factors in advancing type, and used indiscriminately it would be just as effective in bringing about deterioration. The right use of the principle implies but two things—undoubted constitution in the material being used, and realising that there is a danger limit. The degree of prepotency of the sire largely governs the extent to which in-breeding can be carried. But breeders nowadays have not the same reason to adopt close in-breeding as did the founders of our modern breeds who were engaged in the creative work of establishing types. Line breeding is the principle that suits the purpose of our day, and given constitutional vigour—the sire must be

masculine even to coarseness—we may safely practise a system which will enable us to attain our ideal with some degree of certainty, instead of bringing in frequent out-crosses—as is the common practice—and thereby multiplying again and again the tendencies to variation and consequent departure from the type being aimed at.

EXPERIMENTAL IN-BREEDING.

“The effect of close in-breeding on deterioration of type and sterility has been tested by an American scientist, in some cases with quite remarkable results. This investigator, Dr. King, in an address before the Pediatric Society in Philadelphia, in 1915, and summarised in the ‘Journal of Heredity,’ described the results obtained over a long series of experiments with rats. The exhaustive trials made indicated that close in-breeding does not necessarily lead to a loss of size or of constitutional vigour or of fertility if the animals so mated come from sound stock in the beginning, and sufficient care is taken to breed only from the best individuals. The rats, it should be remarked, were closely in-bred for twenty-two generations. The ‘Journal’ remarks that the experiment cannot in the nature of things settle the problem of whether in-breeding is *of itself* injurious. The experiments prove conclusively, however, that if any injuries result they are not so great but that they can be counteracted by careful selection of the animals used. Of course, what applies to rats may not apply to other breeds of stock. The ‘Journal’ makes this final observation: ‘The results of Dr. King’s experiment in breeding rats, and the whole teaching of genetics, however, can be safely followed by the practical breeder to this extent—that he can use a moderate degree of in-breeding through a number of generations without fear of evil results, *provided he is mating the best with the best* in each generation; and that the results in most cases will be a considerable improvement in his stock. The superstitious fear of in-breeding in any form which long hung over practical breeders is rapidly disappearing; for the geneticist it long ago ceased to exist.’ ”

ART OF KILLING PIGS.

Mr. E. L. Wood, a pig-breeder, well known in America, writes:—

“For killing pigs I use a small-bore rifle, and shoot them in the centre of the forehead. This avoids excitement, and the hogs are not exhausted. Then I turn the animal quickly on its back and stick it directly in front of the breast bone, being careful not to injure the shoulder; but instead of scalding in the usual manner I have tried a new wrinkle. Most men dislike the work of scalding a pig because of the steam and smell, and the new plan does away with this entirely. The method as reported to me was to take the dead pig to an open place free from litter or straw, and where there is nothing to catch on fire. Then pour a small quantity of gasoline over the carcase and touch a lighted match to it. The plan sounded so good that I gave it a trial on two large pigs. No directions were given as to the best way of applying the gasoline or the quantity to use. I had been simply told that a farmer in another neighbourhood used the method, and it was very successful. So I put my pigs in a safe place and used the gasoline very sparingly. Less than a pint covered the whole carcase except the part touching the ground.

“We later gave the head and parts of the feet a little more gasoline after the first application, and then turned the pig over and completed the small portion left. At the touch of the lighted match the carcase burst into flames, and burned for perhaps two minutes. At the end of that time the hair was all gone. We then scraped with knives and scrapers, as with the scalding method, and were agreeably surprised with the outcome. The hair stumps and the outer skin which always comes off in a proper scald came likewise after singeing, leaving a nice white carcase. We then hoisted the pig and rubbed it down with a scrubbing brush, using a pail and a-half of warm water. No smell or taint of gasoline or burning hair, or anything of the sort was left, and the cleaning was done in half the usual time.

“With the second pig we made even better time. In using this method the chief precaution is to have the pig in a clear open place, away from buildings, and to bring no more gasoline near the carcase than the amount actually needed. Do not fire the carcase until it is entirely wet with the gasoline.

“The feet, neck, and belly are the parts most difficult to clean. With my next pig I shall hang up the carcase, pour the gasoline on top and let it run down. After the body is cleansed and the entrails removed, I split the carcase, which permits it to cool more thoroughly. I let the carcase become thoroughly cold, so that the meat can be trimmed neatly.”

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JUNE, 1918.

The weather has been very trying during the month. Westerly winds, cold nights, and frosts have been prevalent. Such weather as has been experienced picks out the birds that have had their constitution undermined in any way. There have been several cases of broodiness, one being among the Leghorns. Two deaths have occurred and the birds replaced. The birds generally look very well, and good laying can be expected as soon as the weather improves. Odd pens are feeding indifferently, and this, combined with the cold weather, will not assist their progress. Following are the individual records:—

Competitors.	Breed.	June.	Totals.
LIGHT BREEDS.			
*Dixie Egg Plant	White Leghorns	143	436
*G. W. Hindes	Do.	134	360
*E. Chester	Do.	125	356
*C. Knoblauch	Do.	126	349
*C. P. Buchanan	Do.	124	348
*G. Howard	Do.	133	345
*G. Prince	Do.	113	343
*T. Fanning	Do.	116	339
Mrs. L. Henderson	Do.	95	331
*W. Becker	Do.	124	331
*O.K. Poultry Yards	Do.	108	324
*G. H. Turner	Do.	128	320
*Oakland Poultry Farm	Do.	121	314
B. Caswell	Do.	105	314
*W. Lyell	Do.	121	312
H. Fraser	Do.	88	307
*Dr. E C. Jennings	Do.	94	298
*R. Holmes	Do.	134	294
*L. G. Innes	Do.	105	291
*Range Poultry Farm	Do.	80	281
*E. A. Smith	Do.	123	279
O. W. J. Whitman	Do.	99	279
J. J. Davies	Do.	98	279
G. Williams	Do.	95	276
*T. Taylor	Do.	96	273
*Chris. Porter	Do.	101	260
*J. Zahl	Do.	100	258
*Quinn's Post Poultry Farm	Do.	94	256
R. T. G. Carey	Do.	111	248
*Mrs. A. T. Coomber	Do.	95	234
S. Wilkinson	Do.	79	221
Mrs. L. F. Anderson	Do.	78	211
*Homalayan Poultry Farm	Do.	97	209
*T. B. Hawkins	Do.	65	204
Geo. Trapp	Do.	61	203
Mrs. A. G. Kurth	Do.	55	199
*J. M. Manson	Do.	74	197
Progressive Poultry Pens	Do.	34	194

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	June.	Total.
LIGHT BREEDS— <i>continued.</i>			
*J. W. Newton	White Leghorns ...	59	193
H. B. Stephens	Do.	80	189
H. F. Britten	Do.	47	186
*Mrs. R. Hunter	Do.	88	177
Shaw and Stevenson	Black Leghorns ...	68	163
P. O. Oldham	White Leghorns ...	55	138
W. A. Wilson	Do.	77	128
A. W. Walker	Do.	53	181
B. Chester	Do.	73	118
HEAVY BREEDS.			
*Nobby Poultry Farm	Black Orpingtons ...	142	385
T. Hindley	Do.	116	315
*W. H. Reilly	Chinese Langshans ...	89	287
*W. Smith	Black Orpingtons ...	95	275
*E. F. Dennis	Do.	121	273
*E. Morris	Do.	126	261
E. M. Larsen	Do.	127	258
*A. E. Walters	Rhode Island Reds ...	63	242
*J. W. Macrae	Black Orpingtons ...	120	242
W. J. Mee	Do.	81	231
*Mars Poultry Farm	Do.	123	225
*R. Burns	Do.	127	204
*D. Fulton	Do.	98	161
H. Puff	Rhode Island Reds ...	74	154
A. Shanks	Black Orpingtons ...	110	152
*F. A. Claussen	Rhode Island Reds ...	94	132
Th. W. Lutze	Black Orpingtons ...	72	115
Jar. Fitzpatrick	Rhode Island Reds ...	47	73
Totals ... ..	...	6,297	16,276

* Indicates that the pen is engaged in the single hen test.

RESULTS OF SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	70	72	78	65	74	77	430
G. W. Hinde	79	64	60	61	54	42	360
E. Chester	53	66	54	72	58	53	356
C. Knoblauch	55	48	67	54	63	62	349
C. P. Buchanan	59	49	63	52	65	60	348
G. Howard	53	55	65	53	56	63	345
Geo. Prince	30	60	67	64	62	60	343
T. Fanning	61	61	63	31	63	60	339
Mrs. L. Henderson	53	63	58	25	64	68	331
W. Becker	56	54	42	65	50	64	331
O.K. Poultry Yards	59	61	61	47	58	38	324
G. H. Turner	21	43	53	62	71	60	320
Oakland Poultry Farm	51	53	60	59	45	46	314
W. Lyell	59	58	59	53	41	42	312
Dr. E. C. Jennings	45	63	59	51	52	28	293
R. Holmes	64	53	42	43	41	51	294
L. G. Innes	43	69	70	27	25	57	291

RESULTS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
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LIGHT BREEDS—*continued.*

Range Poultry Farm ...	30	67	25	48	50	61	281
E. A. Smith ...	25	64	51	65	54	20	279
Thos. Taylor ...	27	57	56	35	44	54	273
Chris. Porter ...	9	49	50	39	56	57	260
J. Zahl ...	56	44	46	47	42	23	258
Quinn's Post Poultry Farm ...	62	27	36	34	66	31	256
Mrs. Coomber ...	18	54	39	43	20	60	234
Homalayan Poultry Farm ...	53	45	23	17	54	17	229
T. B. Hawkins ...	50	33	55	8	36	22	204
J. M. Manson ...	60	52	62	6	11	8	197
J. W. Newton ...	38	56	1	25	42	31	193
Mrs. R. Hunter ...	26	49	2	30	28	42	177

HEAVY BREEDS.

Nobby Poultry Farm ...	72	65	57	56	62	73	385
W. H. Reilly ...	51	55	61	27	35	58	287
W. Smith ...	70	42	22	48	39	54	275
E. F. Dennis ...	67	43	40	5	71	47	273
E. Morris ...	29	54	63	60	39	16	261
A. E. Walters ...	37	60	30	42	66	7	242
J. W. Macrae ...	22	13	63	36	54	54	242
Mars Poultry Farm ...	33	47	55	38	32	20	225
R. Burns ...	29	28	18	24	58	47	204
D. Fulton ...	31	31	11	16	1	75	161
F. A. Claussen ...	32	31	6	25	37	1	132

EGG-LAYING COMPETITIONS.

No egg-laying competition is worthy of the name unless it progresses in its methods from year to year, and is something more than a mere contest in the number of eggs that can be laid. The first egg-laying competition in Australasia, that of Hawkesbury Agricultural College, promoted, it may be observed, at the instigation of a newspaper, the Sydney "Daily Telegraph," has done great work for the industry, and to-day is probably the leading egg-laying competition in the world. Time was when the Hawkesbury test was declining in its educative influence on the industry. The standard of the birds exhibited was not what it should be. There was more than a suspicion that many of the competing birds were not pure-bred specimens of the breeds they were supposed to represent. A great advance, however, has been made in the standard of the test since it came under the control of Mr. Hadlington, the present New South Wales expert. Realising the necessity of maintaining type and checking that undesirable deterioration, especially in size, that is taking place in connection practically with all the egg-laying competitions, Mr. Hadlington decided upon a very sound policy. He instituted a weight clause in order to eliminate diminutive specimens. Combating the argument that birds should be accepted because they have been bred from tested high producers, he wisely emphasises

the fact that no matter what the birds are bred from, if the physique is not there they are not fit subjects for competition simply because they are not fit subjects for the breeding-pen. This being the case, it would be a waste of time to test them, and a delusion both to the breeder and the public. Here we see the great value of a test controlled by a Government Department as against tests conducted by societies and individuals. Had any of the New Zealand tests been under the direction of the Department of Agriculture we believe that the very important regulation adopted in New South Wales would have been in vogue in this country, for we very much doubt if any man in the poultry world of this or any other country has done more to fight for standard quality of utility stock than has Mr. F. Brown, the chief expert of this country. He has preached in season and out of season the policy that no matter what the egg-laying capacity of the bird is it is not fit for the breeding-pen if it has not the desired constitution, size, and breed quality. In some cases he has condemned the great majority of the birds in our leading tests as unfit for breeding purposes. Mr. Hadlington has been able to put into practice, by reason of the big New South Wales test being under State control, what has not been possible in this country owing to private direction of competitions. Though a weight class was instituted at Hawkesbury, Mr. Hadlington remarks that in the light breeds many poor specimens competed, and he declares that if strict culling were practicable at the commencement of the competition the average of the section would have been a great deal higher. There was a considerable improvement, however, both in type and physique in the heavy section. The result of doing something to eliminate the weedy types from the competition has provided a remarkable demonstration. Mr. Hadlington reports that the outstanding feature of the test is that the winning groups and many of the individual high producers are birds showing the best type and physique.

INTERESTING FACTS.

We make no apology for quoting the following paragraphs from Mr. Hadlington's instructive report:—

“As bearing upon this subject, the weights of the two leading groups (first-year hens), when received at the commencement of the competition and at the conclusion of the test, will be of interest:

“C. Judson's Black Orpingtons' weights at the commencement of the competition, with the weights at the close in parentheses, were as follow:—5 lb. 6 oz. (6 lb. 12 oz.), 5 lb. 6 oz. (6 lb. 8 oz.), 6 lb. 4 oz. (8 lb. 10 oz.), 6 lb. (7 lb. 2 oz.), 5 lb. 6 oz. (6 lb. 14 oz.), 5 lb. 9 oz. (6 lb. 6 oz.). The hen that has put up the score of 312 eggs increased in weight during the competition from 6 lb. to 7 lb. 2 oz. Mrs. Chalmers' White Leghorn weights at the commencement and close were:—3 lb. 14 oz. (4 lb. 8 oz.), 3 lb. 14 oz. (4 lb. 10 oz.), 4 lb. 4 oz. (5 lb. 2 oz.), 4 lb. (4 lb. 10 oz.), 4 lb. 2 oz. (4 lb. 12 oz.), 4 lb 3 oz. (5 lb. 4 oz.). These were all fairly typical, rather deep-bodied hens, perhaps a little on the racy side.

“The ration fed during the test was as follows:—Morning wet mash: Pollard 60 per cent., bran 20, lucerne dust 12, meat or blood meal 8. Evening grain ration: Two-thirds wheat, one-third crushed maize. These give a combined nutritive ratio of 1 to 4.5. With the morning mash 22 oz. of common salt was used, and, to ensure its even distribution through the mash, the salt is dissolved in the water with which the mash is mixed. Green feed was given at midday.

“Although the above ration is laid down to be fed, and has been fed as far as practicable during the test, as also in previous years, it should not be supposed

that feeding the competition birds has been entirely free from the difficulties more or less experienced by poultry farmers in general in regard to pollard, bran, and even wheat of good quality. During the first six months of the competition in particular a shortage of one or the other, as well as poor quality, was frequently experienced owing to the inability of the department to secure adequate supplies.

“It might be well to point out a few facts in connection with the conduct of these competitions. The first is that the hens are fed on simple food as shown above, such as is available to almost every poultry-keeper; no patent food, condiments, or other stimulating articles are used, nor are any methods to that end practised. Secondly, every hen receives exactly the same treatment, and there is no special pampering of individual hens or groups that may show promise of making big records. Thirdly, each hen must lay eggs not less than 2 oz. in weight in order to compete for a prize. It, therefore, follows that every hen making a record at this competition must have conformed to every essential imposed by straight-out utility qualifications.”—“New Zealand Farmer.”

The Orchard.

BANANA CULTIVATION.

Mr. B. Jewitt, Buderim Mountain, writes:—“For many years I have cultivated bananas, and my experience teaches me not to scarify too deep. I have had areas of from one-quarter to half an acre in my plantation on which no scarifier was used, the only cultivation being done with the hoe. These patches have, for five years, given larger bunches than the bananas which were scarified. It appears to me that the scarifier scrapes the fine hairs or fibres off the horizontal roots, which are the chief agents in supplying nourishment to the plants. I would recommend growers of bananas to try merely chipping from a quarter to half an acre, and prove my statement for themselves. It is advisable to apply a little fertiliser after the first year of planting.”

“THROTTLE” FOR WOODY TREES.

A STEEL GIRDLE FOR FRUITFULNESS.

The County Horticultural Instructor in the Isle of Wight, Mr. C. Martin, referring to the treatment of superfluous wood in fruit trees, advocates the systematic compression of the wood of unfruitful trees that are making too much growth, in order to force them into a fertile condition. He has devised a simple form of band, bolted on one or both sides by a screw, which can be tightened at will. Mr. Martin recommends that this smooth band should be put in place when the sap is down, and holds that this method will do away with the labour of root-pruning. The “throttle” by a turn of the screws can have the pressure increased or released.

THE LATE S. C. VOLLER.

In the passing away of Mr. S. C. Voller, the Department of Agriculture and Queensland generally have lost a man of sterling qualities, possessing keen powers of observation, indefatigable in his work, considering no trouble too great in carrying out his duties, and who was always ready and willing to impart advice and give assistance to anyone in need of instruction or help in all matters relating to Fruit Culture.

The late Mr. Voller possessed the happy knack of being able to impart information owing to his sincerity and keen enthusiasm, which not only enabled him to obtain the confidence of the man on the land, but secured him many friends by whom his loss will be severely felt. Although Mr. Voller was generally known in connection with his duties as an Instructor in Fruit Culture, he, at the same time, possessed a wide knowledge of stock and agricultural matters generally, and was always ready and willing to give advice to those in need of it.

His wide experience enabled him to undertake numerous departmental duties other than those connected with the fruit industry, and when so employed his work always gave satisfaction.

Through his death the Department has lost a very loyal and reliable officer who will be greatly missed, and whose place it will be extremely difficult to fill, as it is seldom one meets with anyone possessing his all-round qualifications. He was also a facile writer and an earnest public speaker. Mr. Voller was also a valuable contributor of articles on Fruit Culture and on other industries which were always favourably received by readers of "The Queensland Agricultural Journal."



PLATE 12.

Viticulture.

PRACTICAL HINTS ON ESTABLISHING A VINEYARD.—No. 3.

By P. MAHONEY.

TRAINING AND TRELLISING.

As the plant is growing, it is very important that the growth it makes should be made the best use of and not allowed to run as Nature chooses; for, to meet with success, Nature should be assisted with a little science, such as "training."

The two topmost buds only of the plant, or cutting, should be allowed to throw out shoots, and only permitted to grow until every danger is passed, which is caused by insects that are likely to eat such young tender shoots, or by being broken off by strong winds. These dangers are generally over when the shoots are about a foot long. When they attain that length, the strongest of the two should be allowed to grow and the weaker being pruned off, leaving a cut that can heal over quickly just above the remaining shoot.

By this time the trellis should be completed, for it is necessary to have it erected by the time the vine has reached this stage, if it is desired to bring the vine into bearing early, for without the trellis-wire it is not possible to train the vine effectually.

All side shoots on the one remaining shoot should be suppressed as soon as they appear, but on no account should the leaf at the axis of the shoot be destroyed, for it shelters the young tender stem from the hot summer sun. The suppressing of side shoots should continue until the vine has got within a couple of inches of the wire. Then the vine should be allowed to grow until a few inches above the wire.

"Now is the time when good judgment is needed," for at this stage it is necessary to make an evenly balanced vine. To do so, the vine must be pinched back so as to cause two buds from below the wire to send out shoots, leaving a little of the vine above the wire, by which to keep it in an upright position, by tying to the wire. The buds from which the shoots are to come should be close to one another and as close to the wire as it is possible to get them. It makes an unsightly and unevenly balanced vine if one shoot is under and the other over the wire.

These shoots are to form the main arms, and therefore they should be carefully trained along the wire, and furnished with spurs, &c. In the event of the arms making uneven growth, it is advisable to pinch the stronger of the two back a little, care being taken not to let any one of them outgrow the other. Do not allow too big a difference to occur before resorting to checking, for too big a check is likely to cause greater difference by encouraging growth instead of checking it. Though the arms may be making even growth, benefit can be derived from pinching the ends occasionally, so as to strengthen the vine and furnish it with spurs.

The method of trellising varies, according to the nature of the vine, just as in the case of pruning. For a non-vigorous spur-pruned vine, only a two-wire trellis is required, and the bottom wire should be no lower than 27 inches from the ground, so as to allow plenty of room for free circulation of air under the vine, which is most essential in a wet district, for low-pruned vines in such districts, or country, are very subject to oidium and other numerous diseases. The next wire should be about 18 inches above the first, to support the foliage.

The cordon system is the best way to train a vigorous trailing vine, as it is hard to balance them evenly if trained on the espalier system. In spite of close attention, one arm is apt to outgrow the other if trained in the latter way. The second wire is also necessary to carry the rods and foliage.

A rod-pruned vine also requires two wires; but "the most successful way of trellising such vines" is on a T trellis, more especially where the rainfall is great, for on such a trellis the bunches hang clear of the foliage and are protected in a roof-like manner from the rains. In this manner the possible loss caused by rains can be greatly minimised, for when the bunches hang clear of the foliage, &c., the moisture can be dried out of them by the wind. If they are protected from the winds by the foliage, then the moisture, being dried out of the bunch by the heat, has a disastrous effect, in splitting the berries when in the ripening stage.

Never should a vine have more than two main arms; with four arms, the two topmost receive the greater supply of sap, as it is only natural for the sap to flow

to the highest points most freely. Thus the bottom two arms do not get enough nourishment; consequently the spurs on it get weakly and die out. They also only produce small and few bunches, compared with the top arms.

It is a golden rule with practical viticulturists to keep the fruiting wood on the same level. It is also very noticeable, in citrus and deciduous fruit-trees, that there is a better setting of fruit on a horizontal branch than on a perpendicular one.

If vines are grown on a hillside, they should never be trellised up and down the hill, except when they are trained on a cordon system, and then the vine should be trained down the hill, for that will have a tendency to regulate the flow of sap more evenly. If trained otherwise, the sap will rush to the buds at the end of the vine, and, consequently, vigorous growth will commence from them, owing to their being the highest part of the vine, and the buds or spurs lower down the vine are at a disadvantage, and, failing to get enough nourishment, they become weak, and consequently die, thus leaving a lot of barren wood on the vine. If the vine needs to be trained on an espalier system, the trellis should run across the hill (not up and down), which will give the desired results.

The systematic training of the roots is also very important, as previously stated. If the plant consists of five or a given number of buds, it is then an easy matter to know what roots to cut away. It is necessary to go round about every three months and cut away all roots which are not required, as a young well-attended plant makes roots very quickly. Breaking the roots with plough or cultivator has not the results that cutting them away has, for they continue to grow from the portion of the broken root.

[TO BE CONTINUED.]

PHOTOGRAPHING STOCK.

Few breeders appreciate the difficulties of the photographer of live-stock in securing even a decent picture of an animal. Some, indeed, appear to think that the camera can hide breed defects, ignore dirt and draggled condition, and, generally, make an animal driven into the corner of a paddock have the appearance of a show champion. Happily, breeders of this class are the exception. It must be frankly admitted, however, that owners in general, even expert herdsmen, fail to realise the importance of condition and get-up to satisfactory photographic work. There are occasions when the camera—by reason of a combination of condition, pose, light, and background—will flatter an animal, but in the great majority of cases the camera will exhibit the weaknesses with exasperating vividness. The expert photographer may be trusted to get the subject in the best position for bringing out its good qualities and to secure the best lighting effect, but it remains with the attendant to have the animal in the best possible form. In the case of cattle the coat must be clean and in as good order as possible, and the tail should be well combed out. Of course, the ground must be level, and it is well to remember that untidy fences have a habit of standing out prominently in a picture. It will invariably pay to go over the fleece of a sheep and remove any irregularities. As with cattle, the ground must be quite level, and preferably the grass should be short. It would pay the breeder to have a photographic site, with a suitable background, facing the sun, and the ground level for some distance. A general rule, and one which should never be ignored, is that patience must be exercised. Seldom, if ever, can a good picture be obtained by exciting an animal. Certainly an alert expression is always desirable, but no attempt should be made to obtain this till the photographer is quite ready to press the trigger of his camera. Some owners have an idea that it looks well to have a prize ticket attached to the headstall. In this they make a mistake. It is just possible that the photographer may secure a striking photograph of the animal, one good enough to be enlarged to serve as a photographic model of the breed, but many an editor would not use the picture because of the disfiguring effect of the award ticket. The less harness there is about an animal the better. What a caricature some of the old Clydesdale grooms do make of their horses—a case of man making himself ridiculous by attempting to improve upon the work of Nature. The owner who desires to take photographs of his own stock should not neglect the details here enumerated. It may happen that he may get a really good photograph of an animal, but because of failure to prepare it, and have it look as well as possible, the picture is useless for publicity purposes—a fact he may have to regret more than once. In short, to obtain a good picture the animal must be good, and it must look to the very best advantage when its image is recorded on the sensitive plate. Many of the photographs of animals sent to us for publication would do the breeder more harm than good were we to publish them, and they would prove a very poor advertisement for the live-stock of this country.—“Exchange.”

Neglected Industries.

PROSPECTS OF RUBBER-GROWING IN QUEENSLAND.

That the Pará, Ceara, and other rubber-producing plants will thrive to perfection in tropical Queensland has long been established, but when capitalists have been approached with a view to inducing them to embark on the rubber industry, the reply has always been: "How can Queensland, with its labour conditions, high rate of wages, and imminence of strikes at critical periods, attempt to compete with countries where there is an abundant supply of coloured labour, where rations are cheap, and strikes unknown, and where rich rubber lands can be obtained for a mere nominal rental, as, for instance, in Papua (British New Guinea)?" At first sight, this argument would appear unanswerable; but, when we come to figure the matter out, it can be shown that rubber-growing under white-labour conditions in this State would be almost as profitable as in black-labour countries. Without going into details, the cost of planting and of upkeep of 500 acres of rubber in Queensland, including wages, buildings, implements, fencing, &c., would amount to about £34,000, the number of trees being 75,000. These trees would be ready for tapping in the sixth year, yielding a net return of £15,000. Leaving a debit balance of £18,872. In the seventh year, the net return would be £30,000, less debit from previous year, or £11,128. In the eighth and following years the net return should be £45,000.

There will, of course, be many contingencies and unforeseen expenses to be provided for, such as, possibly, cost and upkeep of a motor launch, renewal of tools, repairs, &c., whilst the manager's and overseers' salaries still go on, the wages of the labourers being included in the cost of collecting the rubber.

As there is little likelihood of wealthy rubber companies being established in the State for a long time, if ever, let us see

HOW RUBBER-GROWING ON SMALL AREAS WILL PAY.

There are, in North Queensland, on the eastern and western coasts of the Peninsula, areas of sugar land eminently suited for rubber-growing, whilst the climate and rainfall are all that can be desired. Following is an

ESTIMATE OF EXPENDITURE AND RETURNS ON TWENTY ACRES OF RUBBER IN QUEENSLAND.

Supposing the land to have been cleared, the purchasing price may be £20 per acre, on extended terms. From the first to the sixth year the total expenditure on purchase of young trees, annual instalments, interest on purchase money, planting, and cultivation would come to about £432.

In the sixth year the trees will be ready for tapping, yielding 1 lb. of dry rubber per tree; in the seventh year, 2 lb.; in the eighth year, 3 lb. and even more, equal in that year to a return of 9,000 lb. in addition to 3,000 lb. in the sixth year, and 6,000 lb. in the seventh year. The price of rubber being, say, 3s. per lb., the cash return would be £2,700, less cost of collecting, say, 1s. per lb., £900, and about £25 for cases and freight, leaving a net profit of £1,800. During the sixth and subsequent years no cultivation is required.

Many a farm in Queensland is bordered either on one or on all sides by forest or scrub trees which yield to the farmer little beyond firewood. These could be removed and rubber-trees planted in their place. In six years' time these latter would begin to be productive, and to increase in productivity every year afterwards. The tapping process is easily learnt, as is the coagulation of the latex and the subsequent production of marketable rubber, the price of which, after the war, may fluctuate between 2s. and 3s. per lb., a remunerative price, especially where trees have reached the stage when they need no more attention in the way of cultivation, nor any pruning as do the majority of fruit trees.

Some years ago, Mr. A. Molyneux, late of the Agricultural Bureau of South Australia, who is an acknowledged authority in all matters agricultural, contributed to a West Australian journal an excellent article on "Some Minor Products for Farmers," in which he said:

“With regard to many products which might be mentioned, it will be said that the labour bestowed on their production would not be repaid in the price realised for them. That is doubtless correct if we had something better to do with our time, but it does not pay to do nothing, and the innumerable small rills of money rolling into the general income during a year will make quite a considerable amount when added up. The value of a cow and a hen is scarcely worth the attention of the man who expects to grow 3,000 bushels of wheat by the end of the season; and yet he finds that his wife makes more profit from a dozen cows and fifty hens during the year than he makes from his large fields of grain. Why is it thus? Simply because the hens keep on laying, and the cows give their dole of milk every day for the greater part of the time, whilst he only gets the one crop for all his labour. Seeing, then, that these smaller items make profit, it is desirable that we should give them some thought.”

What applies to the wheatgrower applies with equal force to the dairy and general farmer, and to the sugar-grower. These all have most of their eggs in one basket. A rust year, a drought, a severe frost, and the bottom of the basket falls out, with the result that the wheat or cane farmer loses, and neither has anything to fall back upon. But with one or two subsidiary crops, such as are unaffected by seasons, work is provided for many hands, and profit for the farmer, even although losses are sustained on the main crop. The intelligent farmer need never be idle. When the wheat or the cane has arrived at a certain stage of growth, there is no more labour attached to either until harvest time. Why not devote the interval to raising some such crop as will produce the results we have here indicated?

As Mr. Molineux said: “We must try to divide our labour so that there shall be no dull round of similar occupation. It may even be a relaxation to ‘knock off work and carry bricks.’ We want one crop to follow another, and to learn how to harvest, and even to manufacture, such crops, so that the product shall bring approbation as well as profit to us.” Both these ends can be achieved by utilising the waste places of the farm for sisal, kapok, cotton, castor oil, and similar self-cultivating crops for which, in normal times, a world’s market exists. Then should we hear little of the common complaint of the unemployed, for there would be no unemployed, although there would inevitably be some “unemployable.”

As an instance of what may be done in the above manner let us consider the production of

KAPOK.

This is a product for which there is a large demand in Australia, and which can be produced almost anywhere in North Queensland with little trouble and less expense. At present our supplies of kapok come mainly from Java, whence 38,000 bales (of 80 lb. each) are exported annually to Holland, Australia, China, and America, Australia taking over 8,000 bales. This kapok is often called “tree cotton,” and is largely used in the upholstering trade, for stuffing furniture, pillows, bed quilts, &c. The tree producing it grows to a large size, and is propagated either from seed or cuttings taken from a mature tree. The trees may be planted on any well-drained land, on roadsides, in back yards, or on allotments where the land cannot profitably be used for other crops, or on large estates. The only cultivation required is the clearing away of brush or undergrowth. The trees grown from seed begin to bear pods in two years, and in three years will yield a fair crop. If grown from very large cuttings pods will be produced in the first year, but with small, thin cuttings, the time for bearing is the same as for seedling trees. The crops should be harvested in the dry season when the pods are fully ripe, and the seeds can be easily separated from the lint. So far, the only means adopted for clearing the lint are hand labour, but small iron mills have of late been used in Java, which will produce about 250 lb. of lint in a day’s work. Four women are employed for each mill.

Now, as to production per tree. In Java there are over fifty plantations where kapok is produced as a subsidiary crop, whilst on some it is the principal crop. The yield per tree of fibre (after removal of the seed) is given in the “Indische Mercuur” at from 2 lb. 3½ oz. to 111 lb. from young two-year-old trees to 111 lb. from a mature tree yielding 5,000 pods. As to value, we can find no late quotations for kapok fibre in our commercial exchanges from England. Before the war, cleaned kapok (i.e., free from seeds) was quoted at 7½d. per lb., and ordinary kapok, not thoroughly cleaned, at 6½d. per lb.

The planting of kapok-trees requires but little capital and a very small amount of labour. They require practically no care, and flourish on the poorest soil, and there is a constantly increasing demand for the fibre. Here we have a product for which there is a large demand in Australia and which can be produced almost anywhere in Central and North Queensland with little trouble or expense. There are several mature kapok-trees growing and shedding quantities of kapok in several coast towns in the North, whence seed and cuttings could be obtained. The seeds produce a valuable oil, quoted in England in 1918 at £55 per ton.

Forestry.

RATES OF TREE GROWTH.

The Acting Director of Forests, being questioned as to the rate-growth of various trees, gave the following information, which was published last month in the "Brisbane Courier":—

"An area of $5\frac{1}{2}$ acres of *Pinus insignis* was measured. The trees were twenty-six years old, and the total volume per acre was found to be 6,600 cubic feet, nearly 80,000 feet super., a result which has broken the record for rapid growth and bulk per acre, as the quickest-growing pine in Europe—known in Great Britain as the Scotch pine—takes sixty years to produce the same quantity, according to the standard records of growth which have been carefully kept there over a long series of years." (South Australian official report.)

"In New Zealand, Australian eucalypts have grown to be 60 ft. high in less than thirty years, in plantations, while a Californian paper proudly claims that the fastest growth the world has ever known was made by an Australian bluegum, at Pasadena, California, which reached a great height (figures not given), and 5 ft. in diameter, in thirty years. (Some growth.)

"At Gosford, in New South Wales, a Queensland hoop pine planted in poor soil girthed 5 ft. 7 in. at twenty-five years of age, and was estimated to contain 490 super. feet of timber.

"Turning now to Queensland, the home of the hoop and bunya pines, official records of growth don't go back for more than five or six years, so perhaps some of your readers (writes a correspondent) could give authentic information of the growth of these pines when planted for shade, shelter, or ornamental purposes as many have done round their home, both in townships and in the farming districts. As an instance, a very fine grove of bunya pine is to be found at Yandina. Perhaps some of the pioneers there can give dates of planting and present size?

"Forty years ago hoop pine seed was collected at Kin Kin in the natural pine forest for a Brisbane firm. The ultimate destination was believed to be a plantation on Moreton Island. Did this venture succeed? It is surprising that in a State so richly endowed by Nature with forest wealth as Queensland is, possessing timber trees unequalled in the world for durability, strength, toughness, and cabinet timbers which cannot be surpassed, that so very little is known of the silvicultural characteristics of these trees. This may be because all energies have been directed to exploitation, leaving reafforestation to come later. However, this problem cannot be deferred much longer, and if tree-lovers will briefly record their experiences in the growth of Queensland trees, a new, valuable, and highly interesting chapter will be added to silviculture, and will go far to remove the reproach that has been aimed at Australia that the best plantations and cultural knowledge of wattles for tan bark is to be found in Natal, and that the United States have better publications on Australian trees than Australia possesses."

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TO DESTROY BORING INSECTS IN TREES.

Insert a flexible wire into the burrows and inject a small quantity of turpentine or kerosene into the latter, plugging the holes with soft wood or clay. Spraying with a lime sulphur and salt wash is a good preventive, as it acts as a deterrent to the mature insects depositing their eggs (from which the borers are evolved) on the parts sprayed.

General Notes.

THE EXHIBITION.

Beef cattle entries this year are far more numerous than in August last year, when the entries numbered 390, a record at that date. This year there are 750 individual beef cattle entries, not including fats, and more than 100 animals which did not reach the standard of qualification demanded by the National Association were rejected. The great increase in entries demanded additional accommodation, and this has been arranged for.

THE NATIONAL ASSOCIATION.

The Annual Exhibition of the Queensland National Agricultural and Industrial Association, which will open on the 12th of this month, promises to prove highly successful. In a report presented at a meeting of the Association in July, the Secretary, Mr. J. Bain, said that never in the history of the Association had the prospects for a highly successful show been better. Entries in the district exhibit sections constituted a record, there being no fewer than three A and six B Grade exhibits—Darling Downs, Wide Bay and Burnett, and Central Queensland for A Grade; and Crow's Nest, Gympie, Northern Downs, Fassifern, Kingaroy, and Wallumbilla for B Grade. District displays of fruit promised to be exceedingly good, and the Red Lands, which include all that country from Tingalpa Creek to Redland Bay, would compete as a fruit district this year. The fruit displays promised to be amongst the best yet submitted. Live stock entries were so heavy that forty new cattle stalls and yarding accommodation for over sixty head had had to be erected. The export butter and cheese classes, which last year were a record, had this year been exceeded in the classes which had already closed. Perhaps the most pleasing feature of the show would be the fine displays of machinery to be located on Machinery Hill. Quite a number of firms had secured space, and the hill would be a busy and noisy spot during Exhibition week. Owners of the best jumping and trotting studs had notified their intention to compete, and as a result the ring programme would be of exceptional interest. The demand for accommodation in the poultry and dog sections was exceedingly heavy, the same remarks applying to swine and sheep. Although entries would not close for practically another fortnight, applications already received showed that fruit and farm produce space would be taxed to its utmost capacity. The space for commercial purposes inside the annexes had been over-applied for, and in the sideshow area every inch would be occupied.

Mr. J. Beard, Instructor in the Poultry Industry, stated later that the entries in the poultry sections numbered 1,061, which constitutes a record in the history of the Association.

SOCIETIES, SHOW DATES, ETC.

Ingham.—Herbert River Pastoral and Agricultural Association. Show dates: 30th and 31st August.

Innisfail.—Johnstone River Agricultural Society. Show date, 5th October.

Longreach.—Longreach P. and A. Society. Secretary, H. J. Forrest.

Maroochy River Branch of the Queensland Farmers' Union, Yandina. Secretary, F. T. Latten, *vice* F. O. Venning.

The Maroochy Progress Association no longer exists.

Warwick.—Eastern Downs Horticultural and Agricultural Association Show date, 11th, 12th, and 13th February, 1919.

SOAPMAKING.

Replying to a correspondent, "Town and Country" gave the following recipe for making soap without boiling:—

"Take exactly 10 lb. of double-refined 98 per cent. caustic soda power, put it in a can or jar, with 48 lb. ($4\frac{1}{2}$ gallons) of water. Stir it once or twice, when it will dissolve immediately, and become quite hot. Let it stand until the lye thus made is cold. Weigh out, and place in any convenient vessel for mixing, exactly 75 lb. of clean grease, tallow, or oil (not mineral oil). If grease or tallow be used, melt it slowly over the fire, until it is liquid, and just warm; say, temperature not more than 100 degrees Fahrenheit. If oil be used, no heating is required. Pour the lye slowly into the melted grease or oil in a small continuous stream, at the same time stirring with a flat wooden stirrer, about 3 in. broad. Continue gently stirring until the lye and grease are thoroughly combined, and in appearance like honey. Do not stir too long, or the mixture will separate itself again. The time required varies with the weather, and the kind of tallow, grease, or oil used; from fifteen to twenty minutes will be enough. When the mixing is completed, pour off the liquid soap into any old square box for a mould, sufficiently large to hold it, previously damping the sides with water, so as to prevent the soap sticking. Wrap up the box with old blankets, or, better still, put it in a warm place till the next day, when the box will contain a box of 130 lb. of soap. Remember the chief points in the above directions, which must be exactly followed. The lye must be allowed to cool. If melted tallow or grease be used it must not be more than warm. The exact weight of double-refined 98 per cent. powdered caustic soda and tallow, or oil, must be taken, also the lye must be stirred into the grease, not grease or oil added to the lye. If the grease or tallow used be not clean, or contains salt, it must be rendered or purified previous to use; that is to say, boiled with water, and allowed to become hard again to throw out the impurities. Any salt present will spoil the whole operation entirely, but discoloured or rancid grease or tallow is just as good as the finest for soapmaking purposes."



PLATE 13.—ALGAROBIA ; OR MESQUIT BEAN.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JULY, 1918.

Article.								JULY.	
								Prices.	
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.	
Barley	...	...	...	...	...	...	bush.	2s. 6d. to 4s.	
Bran	...	...	...	...	...	...	ton	£6 10s.	
Broom Millet	...	...	...	...	...	...	"	£70 to £76	
Broom Millet (Sydney price)	...	...	...	...	...	...	"	...
Butter (First Grade)	...	...	...	...	...	...	cwt.	128s. 6d.	
Chaff, Mixed	...	...	...	...	...	...	ton	£3 10s. to £3 15s.	
Chaff, Oaten	...	...	...	...	...	...	"	£6 to £9	
Chaff, Lucerne	...	...	...	...	...	...	"	£8 10s. to £12 5s.	
Chaff, Wheaten	...	...	...	...	...	...	"	£6 5s.	
Cheese	...	...	...	...	...	...	lb.	7½d. to 10½d.	
Flour	...	...	...	...	...	...	ton	£12	
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.	
Hay, Oaten (Imported)	...	...	...	...	...	...	ton	£9 10s.	
Hay, Lucerne	...	...	...	...	...	...	"	£3 to £7 15s.	
Hay, Wheaten	...	...	...	...	...	...	"	£4 10s. to £5	
Honey	...	...	...	...	...	...	lb.	3½d. to 4½d.	
Maize	...	...	...	...	...	...	bush.	5s. to 5s. 6d.	
Oats	...	...	...	...	...	...	"	3s. 3d. to 4s.	
Onions	...	...	...	...	...	...	ton	£17 to £20	
Peanuts	...	...	...	...	...	...	lb.	4d. to 5d.	
Pollard	...	...	...	...	...	...	ton	£6 10s. to £7 10s.	
Potatoes	...	...	...	...	...	...	"	£8 to £10 5s.	
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	2s. 9d. to 3s. 6d.	
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£3 10s. to £4 15s.	
Eggs	...	...	...	...	...	...	doz.	1s. 3d. to 1s. 8d.	
Fowls	...	...	...	...	...	...	per pair	3s. 6d. to 9s.	
Ducks, English	...	...	...	...	...	...	"	3s. to 4s.	
Ducks, Muscovy	...	...	...	...	...	...	"	3s. 6d. to 7s.	
Geese	...	...	...	...	...	...	"	7s. to 8s. 6d.	
Turkeys (Hens)	...	...	...	...	...	...	"	7s. 6d. to 12s.	
Turkeys (Gobblers)	...	...	...	...	...	...	"	12s. to 20s.	
Wheat (Milling)	...	...	...	...	...	...	bush.	4s. 6d.	

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	6s. to 8s.
Beetroot, per dozen bunches	...	...	...	...	...	...	9d. to 1s.
Cabbages, per dozen	...	...	...	...	...	...	1s. 6d. to 5s.
Carrots, per dozen bunches	...	...	...	...	...	...	1s. to 1s. 6d.
Cauliflowers, per dozen	...	...	...	...	...	...	3s. 6d. to 10s. 6d.
Chokos, per quarter-case	...	...	...	...	...	...	1s. 6d. to 2s.
Cucumbers, per dozen	...	...	...	...	...	...	...
Lettuce, per dozen	...	...	...	...	...	...	9d. to 1s.
Marrows, per dozen	...	...	...	...	...	...	1s. 6d. to 3s. 6d.
Parsnips, per dozen bundles	...	...	...	...	...	...	...
Peas, per sugar-bag	...	...	...	...	...	...	7s. to 8s.
Sweet Potatoes, per cwt.	...	...	...	...	...	...	3s. 3d.
Table Pumpkins, per sack	...	...	...	...	...	...	4s. to 5s.
Tomatoes, per quarter-case	...	...	...	...	...	...	2s. to 5s. 7d.

SOUTHERN FRUIT MARKETS.

Article.	JULY.				
	Prices.				
Bananas (Queensland), per case	10s. to 14s.
Bananas (Tweed River), per case	17s. to 18s.
Bananas (Fiji), per bunch...	8s. to 10s.
Bananas (G.M.), per bunch	8s. to 10s.
Bananas (G.M.), per case	20s. to 23s.
Lemons (local), per bushel-case	5s. to 6s.
Mandarins, per bushel-case	3s. to 7s.
Oranges (Navel), per case	3s. to 9s.
Oranges (Other), per case...	6s. to 7s.
Oranges (Queensland), per case	6s. to 9s.
Papaw Apples, (Queensland), per quarter-case	8s. to 9s.
Passion Fruit, per half-case	11s. to 12s.
Pineapples (Queens and Roughs), per double-case	8s. to 10s.
Pineapples (Ripleys), per double-case	6s. to 7s.
Tomatoes (Queensland), per half-case	2s. to 6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JULY.				
	Prices.				
Apples, Eating, per case	7s. 6d. to 12s. 6d.
Apples, Cooking, per case...	7s. to 8s.
Bananas (Cavendish), per dozen	3d. to 4½d.
Bananas (Sugar), per dozen	3d. to 4½d.
Cape Gooseberries, per quarter case	6s. 6d. to 10s.
Citrons, per hundredweight	7s. to 8s.
Cocoanuts, per sack	15s. to 25s.
Cumquats, per quarter-case	3s. to 3s. 6d.
Custard Apples, per quarter-case	2s. 6d. to 5s.
Lemons (Lisbon), per case	4s. to 6s.
Mandarins, per case	8s. to 14s.
Oranges (Navel), per case	6s. 6d. to 8s. 6d.
Oranges (Seville), per hundredweight	14s.
Oranges (Other), per case	4s. to 6s.
Papaw Apples, per quarter-case	1s. 3d. to 3s. 6d.
Passion Fruit, per quarter-case	5s. to 8s.
Peanuts, per lb.	3d. to 5d.
Pineapples (Ripley), per dozen	2s. 6d. to 3s.
Pineapples (Rough), per dozen	6d. to 1s.
Pineapples (Smooth), per dozen	1s. to 2s.
Pomelos (poor man's orange) per hundredweight	14s.
Rosellas, per sugar bag	5s. to 7s.
Strawberries, per dozen boxes	4s. to 13s.
Tomatoes, per quarter-case	2s. to 5s. 7d.

TOP PRICES, ENOGGERA YARDS, JUNE, 1918.

Animal.	JUNE.							
	Prices.							
Bullocks	£18 to £21
Cows	£16 to £16 15s.
Cows (Single)
Merino Wethers	43s.
Crossbred Wethers	40s.
Merino Ewes	30s.
Crossbred Ewes	35s.
Lambs	34s.
Pigs (Baconers)
Pigs (Porkers)
Pigs (Slips)

LONDON QUOTATIONS.

Cotton: 2s. 6d. per lb.

Rubber: Para, 3s. 0 $\frac{3}{4}$ d. per lb.; Plantation, 2s. 2 $\frac{1}{2}$ d. per lb.; Smoked, 2s. 1 $\frac{1}{2}$ d. per lb.

THE MAIZE MARKET.

Early in July last the price of maize advanced rapidly from about 4s. 2d. per bushel, the average price at the Roma Street markets in June, to 5s. 3d. and 5s. 4d. per bushel on rail, and later, in July, to 5s. 7d. The reasons for this sudden rise are the shortage of the maize crop in the Atherton district owing to the late cyclone, the persistent dry weather elsewhere, and the impossibility of importing maize as in pre-war times from the Argentine, Java, or South Africa, whilst it is difficult even to secure freightage from the Southern ports to Queensland.

The *Brisbane Courier* (11th July) published the following Brisbane merchants' explanation of the situation:—

“In January and February the prospects for the Queensland maize crop were excellent, and everything pointed to an absolute record, but the continued wet weather upset the early crop, and dry weather caused the failure of the late grain. The middle crop, however, was a record. In January and February, with the good prospects, Brisbane merchants sold forward. They took the risk, and to-day are executing orders at prices which in most cases involve severe losses. There have been

several new features in the market, such as the entrance of New Zealand and Tasmania, which were not at any previous time maize consumers. The prices of fodder lines generally, too, are worth nothing. The oat crops in both New Zealand and Tasmania have failed, and the price of oats in Queensland to-day is £18 4s. per ton, maize being quoted at only £11 3s. 4d. Oaten chaff is quoted at £9, prime lucerne at £12, while barley, if imported from Adelaide, the only selling market, would cost £12 10s. per ton. Again, Queensland has no wheat. There is a suspicion, also, that New Zealand may have been shipping maize to America, as large quantities were going to the Dominion by every boat, it being known that there no labour troubles were to be feared, and easy shipment would be assured. Mention has been made by some of the Cairns crop, but as far as that is concerned, maize will have to be shipped to there during the last months of the year, in return for all that is exported now. Without taking the dry weather into consideration at all, it must not be forgotten that the prices of all other feed lines are high, and interfere with the price of maize. Further, rice has not been obtainable, which means that starch and a number of other lines are being manufactured from maize, and the Maize Products Company has been buying very large quantities. As an instance of the great shortage, it may be mentioned that four weeks ago there was an inquiry on the Brisbane market from America, offering for anything from 1,000 to 10,000 tons, and freight space was guaranteed. Maize in America is at 12s. 6d. per bushel, but it was pointed out to the inquirers that Queensland could not possibly supply the quantity mentioned, and that before the year was out she herself would have to seek maize from outside sources. Townsville is on the Brisbane market for maize, as are also the Northern Rivers of New South Wales, which were supposed to have had a big crop. In fact, it can be said safely that there are orders aggregating at least 150 to 200 tons on the market to-day, while there are many inquiries on the spot from local consumers. There the matter stands. In the past, Java supplied many of the manufacturing concerns, but freight space is not available from there at present, and even if it were, local merchants could not afford to buy. America, Holland, and England will take every pound of the grain that can be obtained, and the case in a nutshell is that there is a big shortage of maize throughout the world. As far as stocks in Queensland are concerned, they are only those which are being held back by the farmers themselves and those bought by merchants to fill forward orders."

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JUNE, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JUNE, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	June.	No. of Years' Records.	June, 1918.	June, 1917.		June.	No. of Years' Records.	June, 1918.	June, 1917.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—continued:</i>	In.		In.	In.
Atherton	1·69	17	0·19	0·51	Nambour	3·39	22	0·21	0·27
Cairns	2·83	36	0·38	0·38	Nanango	1·96	36	0·28	0·09
Cardwell	2·07	46	1·14	0·36	Rockhampton ...	2·05	31	0·12	0·16
Cooktown	2·05	42	1·33	0·30	Woodford	2·63	31	0·34	0·48
Herberton	0·99	31	0·05	0·03					
Ingham	2·43	26	1·05	0·48	<i>Darling Downs.</i>				
Innisfail	7·08	37	3·99	4·23	Dalby	1·65	48	0·25	0·62
Mossman	2·43	10	0·29	0·79	Emu Vale	1·40	...	0·29	0·25
Townsville	1·33	47	0·05	0·07	Jimbour	1·64	...	Nil	0·59
					Miles	1·96	33	0·05	0·25
<i>Central Coast.</i>					Stanthorpe	1·80	45	0·67	0·70
Ayr	1·36	31	0·04	0·42	Toowoomba	2·34	46	0·54	0·60
Bowen	1·64	47	0·07	0·61	Warwick	1·64	31	0·48	0·31
Charters Towers ...	1·44	36	0·01	0·04					
Mackay	2·73	47	2·40	0·54	<i>Maranoa.</i>				
Proserpine	3·92	15	0·48	1·16	Roma	1·68	44	0·02	0·34
St. Lawrence	2·52	47	0·70	0·40					
<i>South Coast.</i>					<i>State Farms, &c.</i>				
Biggenden	1·92	...	0·05	0·07	Bungeworgorai ...	1·48	4	0·02	0·40
Bundaberg	2·82	35	0·02	0·04	Gatton College ...	1·65	...	0·22	0·16
Brisbane	2·59	67	0·20	0·21	Gindie	1·59	...	Nil	0·49
Childers	2·28	23	Nil	Nil	Hermitage	1·93	...	0·91	0·40
Crohamhurst	4·13	25	0·27	0·58	Kairi	0·84	4	0·13	0·23
Esk	2·00	31	0·42	0·27	Kamerunga	2·57	...	0·44	0·35
Gayndah	1·84	47	Nil	0·05	Sugar Experiment				
Gympie	2·52	48	0·02	0·56	Station, Mackay	2·44	...	...	0·64
Glasshouse M'tains	3·97	10	0·58	0·70	Warren	1·59	4	0·28	Nil
Kilkivan	1·98	39	Nil	Nil					
Maryborough	2·88	47	Nil	0·27					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for June this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.13	5.17	6.30	5.0	6.39	5.3	6.30	5.18	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.
2	6.14	5.16	6.30	5.0	6.39	5.3	6.30	5.18	
3	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	H. M.
4	6.15	5.14	6.31	5.0	6.39	5.4	6.29	5.19	4 May ☾ Last Quarter 8 26 a.m.
5	6.15	5.13	6.32	5.0	6.39	5.4	6.28	5.20	10 " ● New Moon 11 1 p.m.
6	6.16	5.13	6.32	5.0	6.39	5.5	6.27	5.20	18 " ☾ First Quarter 6 14 a.m.
7	6.16	5.12	6.33	5.0	6.39	5.5	6.27	5.21	26 " ○ Full Moon 8 32 a.m.
8	6.17	5.11	6.33	5.0	6.39	5.6	6.26	5.21	The Moon will be nearest the earth on the 8th, and farthest from it on the 20th.
9	6.17	5.11	6.34	5.0	6.39	5.6	6.25	5.22	2 June ☾ Last Quarter 2 20 p.m.
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.22	9 " ● New Moon 8 3 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23	16 " ☾ First Quarter 11 12 p.m.
12	6.19	5.9	6.35	4.59	6.39	5.8	6.22	5.24	24 " ○ Full Moon 8 38 p.m.
13	6.20	5.8	6.36	4.59	6.38	5.8	6.21	5.24	The Moon will be nearest the earth on the 5th, and farthest from it on the 17th.
14	6.20	5.8	6.36	4.59	6.38	5.9	6.20	5.25	It will be 12 times its diam. north of the planet Uranus on the 1st at 7.30 p.m.
15	6.21	5.7	6.36	5.0	6.38	5.9	6.19	5.26	There will be a very partial Eclipse of the Moon on the 24th June, commencing about 7.46 p.m. and ending about 9 10 p.m.
16	6.21	5.6	6.37	5.0	6.38	5.10	6.19	5.26	
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.27	
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	
19	6.23	5.5	6.38	5.0	6.37	5.11	6.16	5.28	1 July ☾ Last Quarter 6 43 p.m.
20	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28	8 " ● New Moon 6 22 p.m.
21	6.24	5.4	6.38	5.1	6.36	5.12	6.14	5.29	16 " ☾ First Quarter 4 25 p.m.
22	6.25	5.3	6.39	5.1	6.36	5.13	6.13	5.29	24 " ○ Full Moon 6 35 a.m.
23	6.25	5.3	6.39	5.1	6.35	5.13	6.12	5.30	30 " ☾ Last Quarter 10 14 p.m.
24	6.26	5.3	6.39	5.1	6.35	5.14	6.11	5.30	The Moon will be farthest from the earth on the 15th, and nearest on the 27th.
25	6.26	5.2	6.39	5.1	6.34	5.14	6.10	5.30	
26	6.27	5.2	6.39	5.2	6.34	5.15	6.9	5.31	7 Aug. ● New Moon 6 30 a.m.
27	6.27	5.2	6.39	5.2	6.33	5.15	6.8	5.31	15 " ☾ First Quarter 8 16 a.m.
28	6.28	5.1	6.39	5.2	6.33	5.16	6.7	5.32	22 " ○ Full Moon 3 2 p.m.
29	6.28	5.1	6.39	5.2	6.32	5.16	6.6	5.32	29 " ☾ Last Quarter 5 27 a.m.
30	6.29	5.1	6.39	5.3	6.32	5.17	6.5	5.33	The Moon will be farthest from the earth on the 12th, and nearest to it on the 24th.
31	6.29	5.0	...	...	6.31	5.17	6.4	5.33	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during May, June, and July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Farm and Garden Notes for September.

FIELD.—Spring has now arrived, and with it there will be the usual trouble with weeds, especially on carelessly prepared ground. Therefore, the cultivator and the horse and hand hoe must be kept vigorously at work to check the weed pests and save the growing crops as well as much future labour. Attend to earthing up any crop which may require it. There may possibly occur drying winds, dry weather, and even very late frosts, which have not been unknown in parts of this State even as late as September. Still, good showers may be looked for in October, and much useful work may be done during the present month which will go far to afford a fair prospect of a good return for labour. Plant out *Agave rigida*, var. *Sisalana* (sisal hemp plant), in rows 6 to 8 feet apart, according to the richness of the soil. All dry places on the farm, too rocky or too poor for any ordinary crops, should be planted with this valuable aloë. Especially should limestone country be selected for the purpose. If the soil is very poor, and the plants very small, it is better to put the latter out into a nursery of good soil, about 1 foot apart. Next year they will be good-sized plants. Keep down tall weeds in the plantation, and do not allow couch or buffalo grass to grow about the roots. Sisal will do no good if planted on low-lying wet land, or on a pure sandy soil. It thrives best where there is plenty of lime, potash, and phosphoric acid, all of which (except potash, unobtainable under present war conditions) can be cheaply supplied if wanting in the soil. Sisal requires so little labour from planting to maturity that it should be grown to good profit despite the high cost of white labour. The price of the fibre now ranges from £70 to £100 per ton for British East African, the Mexican being unobtainable. Sow cotton—Sea Island near the coast, and Uplands generally. Caravonica succeeds best in North Queensland. Sow maize, sorghum, imphee, mazzagua, Indian cane, prairie grass, Rhodes grass and paspalum, panicum, tobacco, pumpkins, and melons. Sugar-cane planting should be vigorously carried on. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, ginger, and canaigre, the latter a tuber yielding a valuable tanning substance. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing many kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost. Failing a sufficient supply of these, artificials may be used with good results. Dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and in the latter case, stir the soil early next day to prevent caking. Mulching with straw, leaves, or litter will be of great benefit as the season becomes hotter. It is a good thing to apply a little salt to newly dug beds. What the action of salt is, is not exactly known, but when it is applied as a top dressing it tends to check rank growth. A little is excellent for cabbages, and especially for asparagus, but too much renders the soil sterile, and causes hardpan to form. French or kidney beans may now be sown in all parts of the State. The Lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 feet apart and 18 inches between the plants, and the climbing sorts of 6 feet each way. Sow Guada bean, providing a trellis for it to climb on later. Sow cucumbers, melons, marrows, and squash at once. If they are troubled by the red beetle, spray with Paris green or London purple. In cool districts, peas and even some beetroot may be sown. Set out egg plants in rows of 4 feet apart. Plant out tomatoes 3½ feet each way, and train them to a single stem, either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, endive, vegetable marrows, custard marrows, parsnips, carrots, chicory, eschalots, cabbage, radishes, khol-rabi, egg-plant, &c. These will all prove satisfactory, provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

FLOWER GARDEN.—Continue to plant bulbs as directed last month. Protect the plants as much as possible from cold westerly winds, which may still occur, notwithstanding the increasing temperature. Be careful that the bulbs do not come in contact with fresh manure. Keep a good lookout for slugs. Plant out chrysanthemums, palms, and all kinds of tropical and semi-tropical plants. If hot weather should ensue after planting, water and shade must be given. Sow dianthus, snapdragon, and coleus, seed or cuttings of the latter. Roses will now be in full bloom. Keep them free from aphids, and cut off all spent blooms. This latter work should be done in the case of all flowers. If you wish to save seeds, do not wait for the very last blooms, but allow some of the very best to go to seed. If you have any toads in the garden or bush-house, encourage them to take up their abode there. They are perfectly harmless, in spite of their ugliness, and they destroy an astonishing number of insects injurious to plants. Fill up all vacancies with herbaceous plants. Sow zinnia, gaillardia, amaranthus, cockscomb, balsam, sunflower, marigold, cosmos, summer chrysanthemum, coreopsis, portulaca, mesembryanthemum, calendula, &c.

Orchard Notes for September.

THE SOUTHERN COAST DISTRICTS.

The marketing of citrus fruits, in the later districts, of the late winter or early spring crop of pines and bananas, also of strawberries and Cape gooseberries, will continue to occupy the attention of fruitgrowers. We can only repeat the advice we have so often given in these Notes respecting the marketing of all kinds of fruit—viz., to grade the fruit evenly, pack honestly, and display it to the best advantage if you want to get good returns.

September is a very important month to the fruitgrower, owing to the fact that it is usually a dry month, and that it is essential in all cases to keep the land in a high state of tilth, so as to retain the moisture that is required by the various trees that are in blossom, thus securing a good set of fruit. Where irrigation is available, it is advisable to give the trees a good watering should the ground be dry, as this will induce a good growth and cause the fruit to set well. If an irrigation is given, it should be a thorough one, not a mere surface watering, and once the land is saturated the moisture must be retained in the soil by constant and systematic cultivation. If this is done, one good watering will usually be enough to carry the trees through in good condition to the thunderstorms that come later or even to the summer rains, if the soil is of a deep sandy loamy nature.

No weeds must be allowed in the orchard or vineyard at this time of the year, as they are robbing the trees and plants of both the water and plant food that are so essential to them at this period of their growth.

There is not much to be done in the way of fighting scale insects during the month, as they are more effectually dealt with later on; but where young trees are showing signs of distress, owing to the presence of scale insects, they should be treated, the gas method being the most efficacious. Plant out strawberries.

Beetles and other leaf-eating insects often make their appearance during the month. The best remedy is to spray the trees or plants with one or other of the arsenical washes that are recommended by me in this journal. The vineyard will require considerable attention. Not only must it be kept well worked, but any vines that are subject to the attack of black spot must be sprayed from time to time with Bordeaux mixture. Disbudding must be carefully carried out, as this work is equally as important as the winter pruning, as it is the best means of controlling the future shape of the vine. A very common fault with vines grown in the coast districts is that the buds often remain dormant, only the terminal bud and possibly one other starting into growth, thus leaving a long bare space on the main rods, which is undesirable. When this takes place, pinch back those shoots that have started, and

which are taking the whole of the sap, and force the sap into the dormant buds, thus starting them into growth. This will result in an even growth of wood all over the vine—not a huge cane in one part and either a stunted growth or dormant buds on the rest.

Every care should be taken during the month to prevent the fruit-fly from getting an early start. All infested oranges, loquats, kumquats, or other fruits should be gathered and destroyed, as the keeping in check of the early spring crop of flies, when there are only comparatively few to deal with, will materially lessen the subsequent crops. Land that is to be planted to pines or bananas should be got ready now, though the planting need not be done till October, November, or even later. Prepare the land thoroughly; don't scratch the surface to the depth of a few inches, but plough as deeply as you have good surface soil, and break up the subsoil as deeply as you can possibly get power to do it. You will find that the extra money expended will be a profitable investment, as it will pay every time.

THE TROPICAL COAST DISTRICTS.

September is usually a very dry month, and fruit trees of all kinds suffer in consequence. The spring crop of citrus fruits should be harvested by the end of the month, as, if allowed to hang later, there is a great risk of loss by fly. The fruit should be well sweated, and, if carefully selected, well-graded, and well packed, it should carry well to, and fetch high prices in, the Southern States, as there are no oranges or mandarins grown in Australia that can excel the flavour of the best of the Bowen, Cardwell, Cairns, Port Douglas, or Cooktown fruit.

As soon as the fruit is gathered, the trees should be pruned and sprayed with the lime and sulphur wash, as this wash is not only a good insecticide, but it will keep down the growth of all lichens, mosses, &c., to which the trees are very subject.

Every care should be taken to keep down the crop of fruit-fly during the month. All infested fruit should be gathered and destroyed, particularly that in or adjacent to banana plantations. Watch the banana gardens carefully, and keep well cultivated. New land should be got ready for planting, and where land is ready planting can take place.

Papaws and granadillas are in good condition now, and, if carefully gathered and well packed in cases only holding one layer of fruit, they should carry well to the Southern markets if sent in the cool chamber.

THE SOUTHERN AND CENTRAL TABLELANDS.

Prune grape vines at Stanthorpe in the early part of the month, leaving the pruning as late as possible, as the object is to keep the vines back in order to escape damage from late spring frosts. All vines subject to the attack of black spot should be treated with the winter dressing when the buds are swelling; this treatment to be followed by spraying with Bordeaux mixture later on.

Where fruit trees have not received their winter spraying, they should be treated at once before they come out into flower or young growth. Where the orchard or vineyard has not been ploughed, do so, taking care to work the land down fine as soon as it is ploughed, so as to keep the moisture in the soil, as the spring is always the trying time for fruit trees.

Look out for fruit-fly in the late oranges and loquats in the Toowoomba district. Keep the orchards and vineyards well cultivated; disbud the vines when sufficiently advanced. Spray for codlin moth.

In the Central tablelands irrigate vines and fruit trees, and follow the irrigation with deep, constant, and systematic cultivation. Keep down all weed growth, and fight the red scale on citrus trees with cyanide. The objective of the fruitgrowers throughout Queensland during September and the following months is, "How best to keep the moisture in the soil that is required by the trees, vines, plants, and vegetables"; and this objective can only be obtained by irrigation where same is available, or by deep, systematic, and constant cultivation where there is no water available for irrigation.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. X.

SEPTEMBER, 1918.

PART 3.

Agriculture.

COTTON-SEED FOR DISTRIBUTION.

The season has now arrived when cotton-seed may be sown to the best advantage, as, during the increasing warm weather, and stimulated by the seasonable rainfall which may be expected in September and October, the young plants will make rapid progress and yield an early crop. Although the seed may be sown as late as November, it is preferable to sow as soon as possible after the late frosts, in order to obtain the most satisfactory returns. We may recall the remarkable success achieved by cotton-growers in 1907, who sowed about the months of August and September. The following were some of the authenticated results per acre:—Wallumbilla, 2,240 lb.; Tallegalla, 4,250 lb. and 3,527 lb.; Vernor (Brisbane Valley Line), 3,006, 1,473, and 1,300 lb.; Mackay, 1,368 lb. Similar results were obtained in 1915, but only on a limited scale. The Department of Agriculture and Stock has now a quantity of first-class cotton-seed for free distribution to present and intending growers, who are advised to make early application for a supply, stating how many acres they propose to plant. The seed will be supplied free of cost and railage paid; 10 lb. of seed per acre will be allowed to provide for replants or any other contingency. An advance of 2d. per lb. for the year 1919 will be made upon all raw cotton received by the department, when it will be ginned and marketed on the owners' account, and any surplus after sale, after deducting charges, will be paid to the growers *pro ratâ*. Consignments are to be forwarded addressed to the Under Secretary, Department of Agriculture, Brisbane, who should be advised of the despatch.

EXHIBITION NOTES, 1918.

THE EXHIBITS OF THE DEPARTMENT OF AGRICULTURE AND STOCK AT THE EXHIBITION OF THE QUEENSLAND NATIONAL ASSOCIATION, BOWEN PARK, AUGUST, 1918.

Ever since the inception of the great National Show in Brisbane, over forty-three years ago, the record of the work of the National Association has been one of steady progress, and this year has seen a result which might well be considered phenomenal, both in the number and quality of the various exhibits, in the general arrangements, especially for the accommodation of the greatly increased numbers of live stock, and in the attendance of visitors from far and near. In this respect, each succeeding year has scored a record over the previous year. War, involving an increase in the price of almost every commodity of life, heavier taxation, and the calls upon the people for subscriptions for assisting in every possible manner the army of Queensland soldiers who have made, and are yet making, an undying name for themselves and for their country in the sanguinary battlefields of France, Egypt, Gallipoli, Mesopotamia, and elsewhere—all this has not had the effect of causing the National Show to be neglected. The attendance this year amounted to 155,000, and the gate-takings each day made an aggregate of £7,005. The weather during the whole week was perfect, a slight fall of rain on the last day serving merely to lay the dust. Pages full of interest to the public might be written on the exhibits, but the space available in this journal being limited, we must ask our readers to study the voluminous reports on the exhibits and prize awards, so ably presented by the daily Press, city and country.

DEPARTMENT OF AGRICULTURE AND STOCK.

It may be remarked apropos of the scope of work of the Agricultural Department that the world's war has focussed attention on the primary producer, and recognition of the important part played by the latter in the production of raw materials will establish his position more firmly than ever in the future as an indispensable adjunct and factor in the world's progress. As nations cannot starve, it is obvious when the Councils of Empire meet to discuss the question of feeding the teeming millions of consumers, and provide for the debt which humanity is shackled with for all time, that the producer must receive the consideration due to the indispensable nature of his calling.

This State, above all others, enjoys a versatility of production which will focus attention on its development. For quite a number of reasons, cultivation methods under pioneering conditions are seldom, if ever, thorough, but it goes without saying that the new era, born of present day developments, will bring in its quota of changes to the farmer, who has many difficult problems ahead of him to solve; not the least of which is the upward trend in the cost of production and the uncertainty existing as to the values of produce and stock, the sales of which represent his income. The closest co-operation is needed between the primary producer and the scientist, and it is in this latter direction that ample scope exists for the activities in field and laboratory of the trained staff of the Department of Agriculture. Science may be described as merely a knowledge of underlying principles and causes. Its application in the direction of improvement of animals and plants, and in the elucidation of the problems confronting the producer, is intimately associated with the work which the several subsections of the Department of Agriculture and Stock have in hand. It is not possible, of course, at an exhibition to illustrate all the work which is being dealt with, but an attempt has been made in the Court to demonstrate the practical bearing and utility of the department in its relation to primary production.

DESCRIPTION OF EXHIBITS.

SUGAR CANE.

The collection of canes from the Experiment Station at Bundaberg (one of a number of stations controlled by the Bureau of Sugar Experiment Stations) was classified and the characteristics of each variety described. The importance attached to the selection of the best canes for Queensland conditions is evidenced by the fact that prior to 1904 over 500 different kinds were introduced from other countries, and from 1905 to 1916 another 360 new varieties were brought here, most of them being from New Guinea. These were tested at the Experiment Stations.

In 1895 the Agricultural Department deputed the present Entomologist (Mr. Henry Tryon) to visit Papua. This officer brought 66 varieties with him, and if

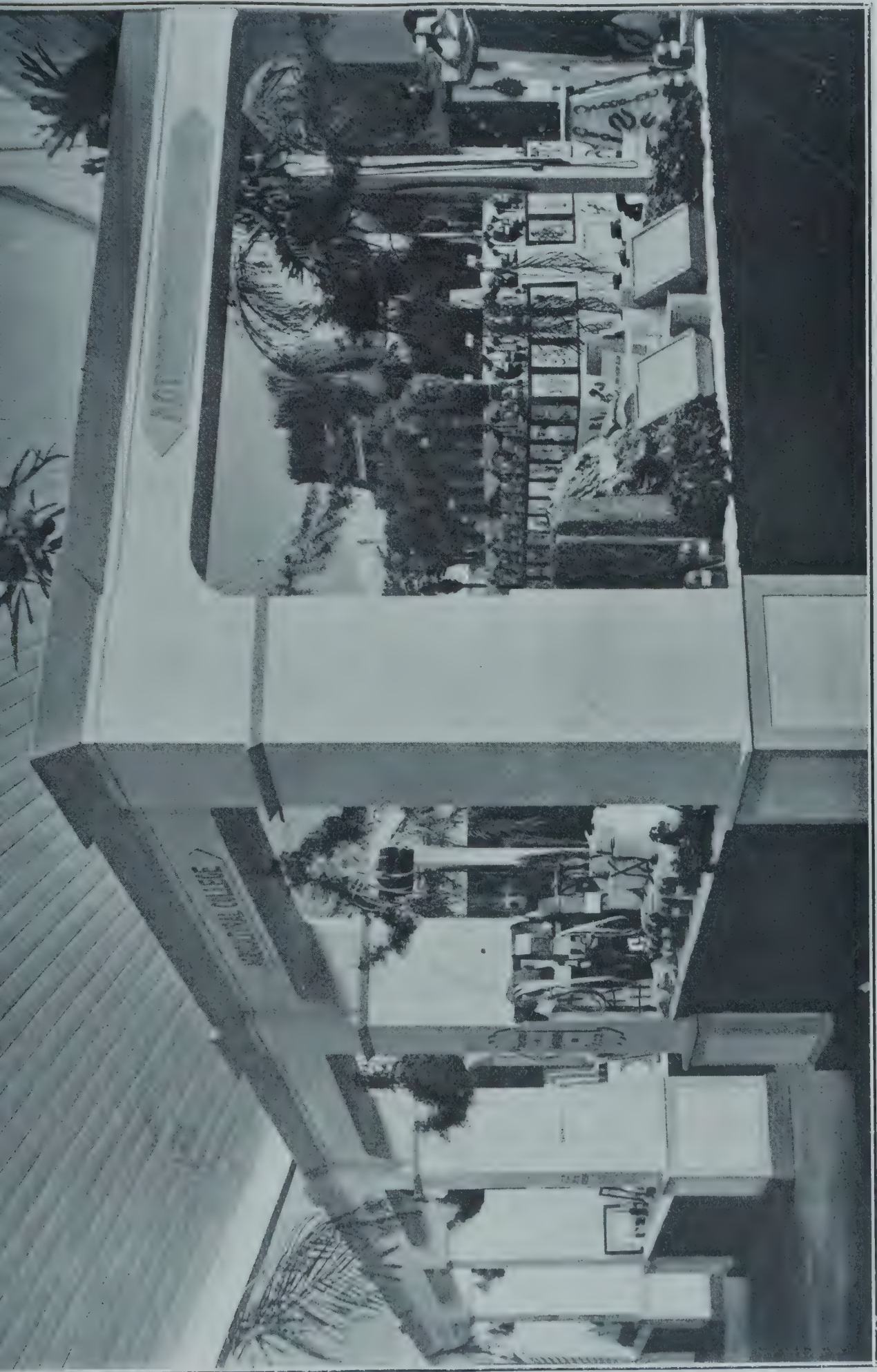


PLATE 14.—VIEW OF COURT, DEPARTMENT OF AGRICULTURE AND STOCK.

any proof of the value of such introductions is necessary, it may be stated that to-day the standard cane of North Queensland (Badila) is one of those then introduced.

This cane carries only a small percentage of fibre and is exceedingly rich, as will be seen by the analysis:—

<i>Brix</i> Total Solids.	Per cent. Sucrose in Juice.	Per cent. Glucose in Juice.	Per cent. Sucrose in Cane.	Quotient of Purity.	Available Sugar.
22·6	21·4	0·21	18·6	95·0	17·85

The method of testing these introductions, as well as that of seedlings raised in Queensland, is to grow the canes for a period of years and over a number of ratoon crops, each variety being analysed no less than four times in each year during the months of June to September. Those showing high percentages of sugar, which have proved to be good croppers and absolutely free from disease, are made available to farmers and plantations; others, light in weight and difficult to cut, being valueless from the farmer's point of view, are discarded.

Five of the original New Guinea varieties, tested over a "plant" and five "ratoon" crops, gave the following results:—

					Total Cane per Acre. Six Crops.	Total Sugar per Acre. Six Crops.
					English Tons.	English Tons.
15	Badila	..	..	..	270·5	50·2
24	..	..	..	..	255·1	46·3
24A	..	..	..	..	266·7	45·6
24B	..	..	..	..	257·5	42·2
40	..	..	..	..	253·4	38·8

In addition to the introduction and testing of canes, soil investigations are undertaken at the Mackay and Bundaberg Experiment Stations and analyses made of fertilisers, limestones, waters, sugar-canes, and sugar mill products.

A new station is being established for the North of Innisfail.

The depredations of the cane grub, the larvae of the *Lepidiota* beetle, have led to the establishment of Entomological laboratories at Meringa, near Cairns, the centre of the worst grub-infested region in the North. The work is in charge of Dr. J. F. Illingworth, formerly Professor of Entomology at the College of Hawaii, and embraces the following:—

Morphological study of reproductive organs of beetles, with relation to the period of ovipositing and the number of eggs produced.

Morphological study of the fungus parasites.

Breeding of the various local parasitic and predaceous insects in cages.

Introduction and breeding of beetles parasites from other countries.

Experimental methods for the rapid multiplication and wide distribution of our fungus parasites.

Introduction of bacterial and fungus enemies of the beetles from other countries.

A further study of various light-traps for the beetles.

A further study of repellents.

Field and laboratory experiments in the use of poisons for the grubs.

Field experiments to determine the relation of fertilisers to resistance; using green manure, stable manure, meatworks refuse, nitrate of soda, &c.

It is estimated that 100,000 persons are directly or indirectly connected with the sugar industry in Queensland, and as the last season's crop was valued alone at £7,000,000 for raw sugar (£9,500,000 refined), these figures will afford some idea of its importance and of the value of the work of Experiment Stations in assisting to combat the many difficulties which beset the producers.



PLATE 15.—EXHIBIT OF VARIOUS SUGAR CANES RAISED AT THE BUNDABERG SUGAR EXPERIMENT STATION.

AGRICULTURE OTHER THAN SUGAR.

In this section a great variety of products was staged and proved eloquent of the potentialities of the State in agricultural production.

Prominence was given to Queensland's principal cereal, maize, and the work of Departmental officers engaged in the improvement of varieties now under cultivation. This has the merit of an undertaking which must soon exercise an influence for the better on the quality and quantity of grain produced in the State.

Statistical information has been prepared showing the following:—

Yields recorded for 15 years, 1900 to 1915.

Maize selection on performance.

Shelling percentages of different varieties.

Comparisons in yield from 1914 to 1918 in the corn growing competition.

In the latter chart the average yields show a decided improvement each year, viz.—

		Per Acre.			Per Acre.
1914-15	..	39.3 bushels.	1916-17	..	62.2 bushels.
1915-16	..	51.3 „	1917-18	..	85.3 „

The principles of selection for type and productivity are illustrated, special attention being given to the factors and characteristics to be looked for in improving crop yields.

Samples of manufactured products and by-products of maize were exhibited in order to show some of the commercial uses to which the grain can be put.

The wheat exhibit comprised a collection in grain and sheaf, principally from the Roma State Farm and experiment plots, and served to demonstrate that, to produce high quality wheats suitable for Queensland conditions, they must be raised and selected here in order to secure the best for the different soils and environment peculiar to our climatic conditions.

The system in vogue in the Department is to carry out field and variety tests in different districts of the State, with the most promising varieties raised and proved beforehand at the Roma State Farm, where wheat breeding is specialised in.

Flour and by-products from wheats tested in the agricultural laboratory served to complete this section.

Several varieties of cotton were shown, including a selection of pods or bolls of one particular kind which has special characteristics stamping it as a suitable one for the employment of machines in picking. Samples of lint from this year's ginning were also exhibited. It is generally well known that on the decline of cotton-growing the Agricultural Department took up the matter of resuscitating the industry. Cotton seed is supplied free, and the resultant crop is received, ginned, and marketed on a co-operative basis, advances being made against cotton sent in for ginning purposes. War scarcity, the unlimited demand, and the high prices realisable are causing a revival of interest in the crop. Up to 31st July this year, 130,600 lb. of raw cotton have been received by the Department for ginning purposes. Sales so far have been made this season at 1s. 1d. per lb. for lint, a price which will pay the growers handsomely. Last year's lint brought 11d. per lb., and a concrete case is cited where a grower, who put in 8 acres of Upland cotton, secured a net return of £154 as a set-off against the cost of production. Ginning expenses at the rate of a farthing per lb. for raw cotton, railage and handling charges, are not included in the amount mentioned.

Sisal hemp on exhibition, raw and manufactured in the form of binder twine and ropes, was a sufficient indication of the excellent quality of the Queensland-grown article. Although the industry is in quite an embryo stage, the possibilities are manifest when it is known that the present quotation for sisal fibre has more than doubled since the war.

Broom millet formed the subject of an educational display, specially prepared to draw attention to the possibilities existing in the State for raising quantities of first quality "fibre" to meet the shortage the Commonwealth is now suffering from. Prime hurl is worth £90 per ton in Sydney. As crops of half-a-ton per acre can be expected under favourable climatic conditions, prospective growers have an excellent chance ahead of them, provided prices keep up.

A small exhibit of Japanese Upland rice and rice paddy, representing 60 acres of crop harvested recently at Tolga, North Queensland, showed that this cereal can be produced to perfection in the State. As good returns have been secured and the crop is capable of being harvested and prepared for market with labour-saving machinery, the future of the industry seems assured, and colour is lent to this optimistic opinion by the fact that other farmers in the vicinity of Tolga intend planting additional areas this season.

GRAIN OR DRY-DISTRICT SORGHUM.—These drought-resistant plants have not yet been taken up for stock feeding purposes to the extent which their excellent cropping and utility deserves. In America several million acres are cropped annually. The grain of these sorghums is large and the yields exceptionally high: drought-resistance, and ability to produce crops of grain under trying conditions where maize would fail, stamp them as worthy of attention by poultry farmers, dairymen, and pig raisers. Horses are very fond of the seed, which, from a feeding standpoint, is midway between the wheat and maize. Yields obtained upon Departmental plots ranged from 85 to 103 bushels per acre, the latter quantity being secured from Cream Milo. A system of improvement and selection of high-yielding strains is being carried on by the Department, and seed ears, sheaves, and grain of several varieties were on exhibition.

TOBACCO.—Pipe and Turkish leaf from Inglewood and cigar leaf from Bowen represented samples of the high-class tobaccos which are grown in the districts named. The Department has imported seed of the most favoured kinds from America to enable growers to secure supplies.

FODDERS.—A collection of fodders suitable for green feed, hay, or ensilage has been made, comprising sorghums of sorts, some of which yielded up to 32 tons per acre of green feed on a field test plot; Soudan grass, and other popular drought-resistant fine-stalked sorghums; also *Setarias* and *Panicums* representing suitable catch crops of rapid growth which are deserving of every attention from stock-owners.

Farm and garden seeds were in great variety, indicating that many kinds can be satisfactorily grown in the State, a matter which deserves more consideration than it now receives. Cowpeas, standard varieties and others, raised by cross fertilisation, illustrated a branch of work in hand at the Roma State Farm which gives promise of improved kinds for green manuring, fodder, and seed purposes. The merits of the plant entitle it also to more attention, as it is suitable for a variety of purposes, not the least of which is its natural richness as a food for pigs when kept under the paddock system.

Latterly some recognition has been given to flax (linseed) growing in Queensland, more on account of the value of the plant for oil-producing purposes than for fibre; consequently an exhibit of different varieties was made.

Buckwheat was also shown in sheaf and seed to draw attention to the plant, which is useful for honey-producing purposes in a minor degree, and for pig-raising and stock-feeding purposes.

The Juvenile Corn Growing Competition and the excellent collection of maize ears sent in to be judged for uniformity of type and character of grain was, in its class, a feature of the exhibition. The average yield, 85.3 bushels per acre, obtained in this competition stamps it as being the most successful from the standpoint of yield of any so far held. The winner of the competition is E. V. E. Burton, of Boobie, who secured the phenomenal return of 169.6 bushels per acre. The second and third highest aggregate reached 153.3 and 145.1 bushels per acre, secured by two brothers named Gon Chee at Killarney.

ENSILAGE.—Several samples taken from silos and stacks represented a class of succulent fodder which all dairymen should have on hand as a set-off against dried-out pastures. The stacks from which the ensilage was taken were constructed under the supervision of Departmental dairy inspectors, whose efforts in this direction appear to be very much appreciated by stockowners.

An interesting exhibit of sugar-cane ensilage, representing 40 tons made in a reinforced concrete silo at Kairi State Farm, North Queensland, showed a new use for cane, in which form it makes a highly palatable fodder.

The *Seed Exhibit* drew attention to the Pure Seeds Acts, which prescribe standards of purity and germination for agricultural and vegetable seeds, and many farmers now avail themselves of the services of the Seed Laboratory before either buying or selling seeds for sowing. The work in this direction is ever on the increase, and the National Show gave farmers and others an opportunity to examine a standard collection of seeds, and to correct many errors that creep in by the misnaming of well known varieties.

It is possible for many people to somewhat resemble the small boy, who, after three weary weeks in learning the alphabet, was asked by his teacher to name a certain letter. After some moments' thought, he replied that he knew him by sight, but did not know his name. The named collection of weed seeds, if examined for a few minutes, should be the means of giving much information.

In order to get into close touch with farmers and others interested in seeds, an officer of the Department was in attendance at the exhibit, and it was suggested that farmers, if possible, make it a point to have a few minutes with him during the week.

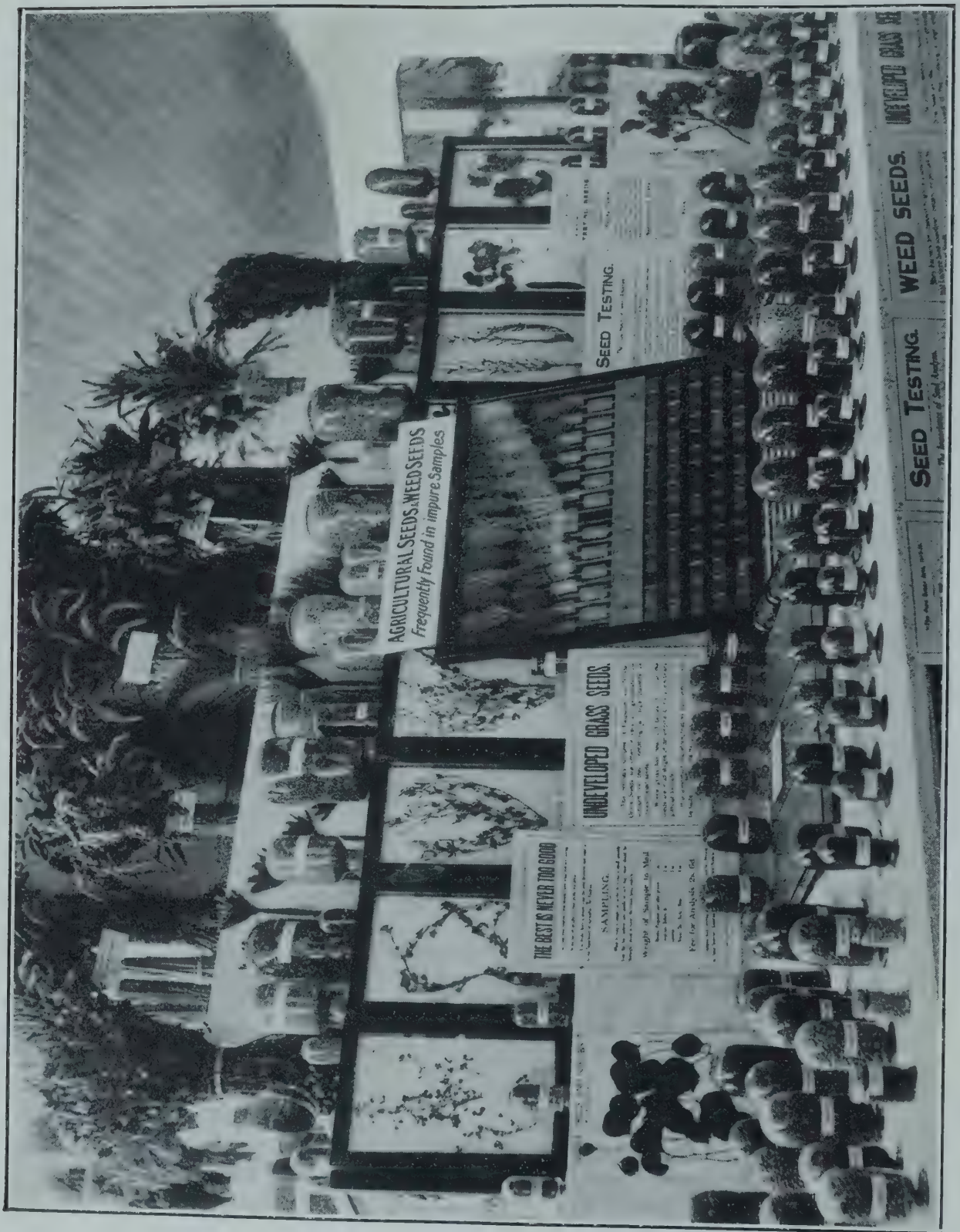


PLATE 16.—PURE SEEDS AND SEED-TESTING EXHIBITS

The simple method of seed testing demonstrated is one of the easy ways in which all cereals could be tested for germination. In the farmer's own interest, he cannot afford to buy or sow any but the best, and much good would result if all buyers placed quality before price, and obtained a thorough knowledge of the article before either buying or selling.

Seeds are the most variable article the farmer has to do with, and farming, like any other business, cannot afford to leave doubtful points to chance.

The ingenious author of "Gulliver's Travels" mentions the high repute in which those Lilliputians were held who made two blades of grass grow where only one grew before. It is a somewhat lengthy journey from the regions of Lilliput to Queensland, yet one of the wild chimeras of choosing for employments persons qualified to exercise them appears to have been solved in the excellent educational display of the Department of Agriculture and Stock at the National Show.

QUEENSLAND AGRICULTURAL COLLEGE.

This year the College was represented in the Agricultural Court by an exhibit illustrating various features of the instructional work carried out for the students—the Dairy Factory, Sheep and Wool, Seed Testing, Saddlery, Blacksmithing, and Farm sections.

In the Live Stock Division the College was represented by the following:—

Dairy Cattle: Ayrshires, Holsteins, Guernseys, and Jerseys, a total of twelve animals. Amongst the Ayrshires "Auntie's Lass," last year's reserve champion, was brought down; also "Prim," last year's champion Holstein cow, and a young Holstein bull, recently imported from New Zealand. In all cases the stock were good and they well represented the quality of dairy stock that are being bred at the College.

In the pig section, twelve animals were exhibited, representing two breeds, Berkshires and Middle Yorkshires, which included animals recently procured in the South, and others College-bred.

With the poultry section the College again had its full-size model poultry pens on exhibition in Petrie's Paddock. Since erecting these pens at last year's National Exhibition, the College has adopted the design for all new poultry buildings, and in actual practice these classes of pens have proved themselves in every way efficient.

Besides this, there was a large exhibit of crossbred table poultry. Some of the male birds had been caponised and were shown alongside the entire birds to illustrate the many advantages of caponising. In fact, the whole exhibit in this section was intended to stimulate interest in table poultry and to demonstrate the value of caponising. A brief pamphlet on this latter subject was available for distribution.

WOOL EXHIBIT.

The exhibit this year comprised a number of fleeces of farmers' wool grown mainly on coastal areas; also representative fleeces of pure-bred British breeds which are being used in raising fat lambs. A number of cases were shown which contained samples of various breeds of wool grown in Queensland; also staples of South Australian rams' wool from sheep which are being used to improve the Gindie State Farm flock. Decorative panels of scoured merino, crossbred black wool, and crossbred greasy wool, were most informative.

The fullest possible information was given, on plainly printed placards, of matters interesting to sheep farmers, some of which may be mentioned hereunder:—

Signs of Worms in Sheep.

Arsenical Drench for Wormy Sheep.

Suggestions for Combating the Blow Fly in Sheep.

A résumé of the results of the handling by the Department of small farmers' wool clips for the past year.

The matter of worms in sheep has been a very serious question in nearly all parts of Queensland this year, and it is safe to say that more losses have occurred from this cause than any other, especially in the case of animals under two years of age. Generally, it has been found that serious losses have occurred before advice was sought; this being due to the fact that, outside the districts which have hitherto not been free from the trouble, there is little or no knowledge regarding internal parasites. The instructions given on the matter of recognising the plague were short and clear.

In the second placard, one method of treatment effectively used by the Department was given. This takes the form of a prescription containing arsenic and Epsom salts. Further information in regard to this matter was supplied by an official who was in attendance at the exhibit.

Closely allied to the question of internal parasites, such as stomach worms, is the matter of external parasites, such as the blow-fly. In the experiments conducted by the Department for the past four years several positive facts have emerged.

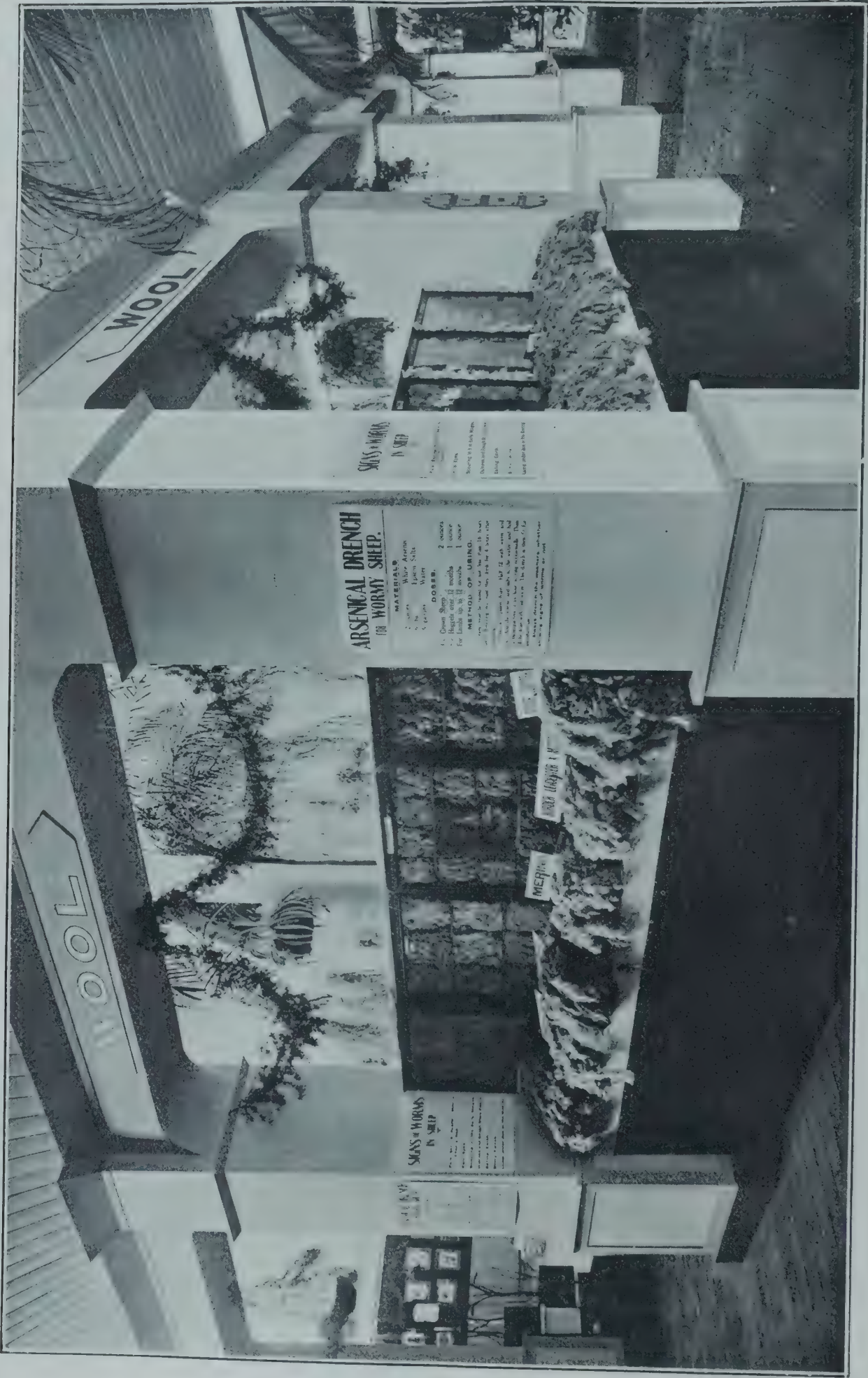


PLATE 17.—WOOL EXHIBIT.

PRUNING



PLATE 18.—AN OBJECT LESSON IN PRUNING VINES AND FRUIT TREES.

First, that a healthy sheep is less liable to be struck by flies, and if struck, is less liable to die. Therefore, the first duty of a sheep farmer should be to see that, at least, his sheep are not dying of stomach worms.

Secondly, the use of poisonous dips is clearly of advantage. In the latest figures supplied by an experiment now being conducted, the gross infestation by flies in a flock of nearly 1,000 stud merino ewes is shown to be 7.32 per centum. Of those treated in various ways with poisonous dips, the different flocks of 50 sheep showed infestation from .0 per centum up to 14 per centum, while the controls which were quite untreated showed an infestation of 30.3 per centum. This result agrees with former experiments held in quite another district.

Other advice also appeared on the placards, representing the results of practical experience which are given for the benefit of sheepowners.

Thirdly, though some years show that even a small infestation on an animal is very likely to cause death, this year the whole body of an animal may be involved and yet the animal lives. This points either to the fact that a special organism, or a special kind of fly, is absent this year. This matter will be thoroughly investigated.

Another placard showed that a fairly large number of farmers have availed themselves of the departmental scheme for handling small farmers' clips, about 360 bales having been dealt with, which represents the pooled clips of 122 farmers. General satisfaction has been expressed, and it is confidently hoped that the business will expand. To that end the Department is now fitting out a thoroughly equipped wool-sorting shop at the offices, William street. This will be ready for the coming season in a short while.

Attention has been called by the Wool Committee to the poor get-up of many Queensland clips. This adds seriously to the difficulty of putting a fair value on a consignment, and it is for this reason that mixed clips of merino and crossbred, such as the smaller sheep farmers possess, should be graded if the best results are to be attained. This the Department is aiming to do for farmers with under 1,500 sheep. Added advantages to the farmer are: lower charges per lb. for commission, brokerage, &c., skilled manipulation of his wools, and an immediate advance of 60 per centum on receipt of wool at the Departmental Stores, William street. Full particulars were shown of the scheme in the placard. The value of the wool industry to Queensland was shown by figures for 1917-18—312,418 bales of wool were assessed in Queensland, somewhere in the neighbourhood of £5,500,000 sterling. The difference between a good "get-up" and a bad, may sometimes be 2d. per lb. Therefore, the importance to owners of having their wool well treated is obvious.

DISPLAY OF PRUNING, PROPAGATION, Etc.

This section of the Horticultural Branch had for its object the instruction of amateurs and young orchardists in the methods of propagating, pruning, training, and treatment of young fruit trees from the seed bed and nursery row to the transplanted tree. The exhibit also comprised examples of various systems of pruning and training grape vines and orchard trees. It illustrated also how to treat seedlings and maiden stocks and showed the progress of budded and grafted plants and cuttings up to the time of their permanent establishment in the orchard.

EXHIBIT OF WEEDS, GRASSES, AND FODDER PLANTS.

The attention of agriculturists, pastoralists, and horticulturists was invited to a representative collection of weeds mounted and framed, comprising over 100 kinds, a large percentage of which, it may be noted, are not indigenous but have been introduced at different times by various agencies. Some came as ornamental plants and have strayed from cultivation; others in straw or hay that had been used as packing material, or mixed with flower or vegetable seeds. This latter source is now controlled by the operations of the Pure Seeds Acts. Amongst those introduced as garden plants may be mentioned the *Ageratum* or "Billy Goat Weed"; *Argemone mexicana*, the prickly or Mexican poppy; the lantana, and the *Asclepias curassavica*, redhead or milky cotton bush; all these plants are still listed in European seed catalogues for sale. *Erigeron linifolius*, the rag weed; *Tagetes glandulosa*, stinking rodger; and *Bidens pilosa*, the cobbler's pegs, are shown; they are well known troublesome weeds of newly-cleared land or neglected cultivations. *Phytolacca octandra*, the ink weed, an American pest, and *Erechthites*, the Commonwealth weed from Brazil, are a nuisance on newly fallen scrub land that is being allowed to dry for burning, as the dense succulent growth of these pests smothers what would otherwise be an excellent burn-off. All these weeds, most likely, came in seeds imported for garden or field culture. The khaki weed from South Africa is another unwelcome visitor. It has a dense-growing trailing habit, and, being armed with sharp burrs, it causes great annoyance to stock when dry. A notable weed—weed only when in places where it is not required, such as on tennis or other lawns—



PLATE 19.—PORTION OF EXHIBIT OF NATIVE GRASSES.

Stylosanthes mucronata, is very common about Townsville, growing flat on the ground, forming a thick carpet. On analysis by the Agricultural Chemist, at the instance of the late Mr. G. Tucker, Deputy Chief Inspector of Stock, it was found to be quite equal to lucerne as a fodder; and milking cows do really well upon it. In the collection was a number of weeds that are truly noxious on account of their poisonous properties, and they should be taken special notice of by stockowners. Amongst these may be mentioned *Gastrolobium grandiflorum*, the wallflower or heart-leaf poison bush; *Eremophila maculata*, the native fuschia; the *Datura* or thorn apples, and *Erythrophoeum Laboucherii*, the iron-wood; this latter is very poisonous, even goats having been known to die within a few hours after eating it. Many of the *Cassias* are often sent in under various names, such as wild senna, arsenic bush, &c., as being harmful to stock. They are not likely to be poisonous, but coming as they do, from the family that produce the cascara and senna leaves, are mostly all purgative in their action. Each specimen was labelled with the botanical and common name, and information was also given as to its uses and properties.

Grasses.—A large collection of grasses was shown in fair-sized sheaf form, and as they show that our State well deserves its reputation of having very rich native pastures, a brief reference to some of the more noticeable kinds might be made. The *Andropogon* or blue grass family is well represented with several kinds. *Andropogon sericeus*, the blue grass, and *A. erianthoides*, the satin-top, are both very quick to respond to a shower of rain after a dry spell. The *Astrelbas* or Mitchell grasses were shown in four kinds—viz., the common Mitchell, the curly, the wheat-ear or bull, and the wire Mitchell. These are the great stand-by grasses of our inland plains country, keeping good as they do in a dry state for a very long time, and it is wonderful to see how the apparently dead tussocks of these grasses respond to rain after quite a long drought. The *Anthistirias* contain the well-known kangaroo grass, *A. ciliata*, and the tall-oat grass, *Anthistiria avenacea*, both rather coarse in growth, but when young relished by stock. A near ally, the red Flinders, *Iseilma Mitchellii*, is often found growing in the shelter of the Mitchell grass; it is a favourite food of sheep and cattle when in a dry state, and if cut and stacked makes splendid hay. A large number of *Panicums* and *Setarias* were shown. These are all good fodder grasses, and the seeds are much sought after by the galah, cockatoos, and other birds. Attention was drawn to the blady grass and its suitability for paper-making. The *Eriochloa* contain the early spring grass and the dairy grass. Both are amongst the very first to grow after rain, and are soft, succulent, good cattle grasses. Several *Paspalums* were shown, and native *Sorghums*, although coarse in growth, are good feed for cattle when young. Grasses that are a pest under certain conditions are *Heteropogon contortus*, the bunch spear grass; some of the *Aristidas*, the three-awned spear grass; and *Stipa setacea*, called the Southern spear grass; they are all very objectionable to the woolgrowers.

NAMING OF SPECIMENS.—The Department is always willing to assist interested persons by identifying and reporting on any specimen that may be sent in.

Forage Plants.—A remarkable and valuable feature of Australian vegetation is the large number of trees, shrubs, and herbage generally, apart from grasses, of the inland country, that are edible for stock. The collection shown by the Department, gathered in the Charleville and Wallumbilla districts, proved interesting and instructive to pastoralists and stockowners generally. Those of special note are the mulga, kurrajong, apple-tree, wild orange, native pomegranate, beelah, emu bush, mustard bush, whitewood, myall, and several saltbushes. These and many others have helped to keep stock not only alive but in good condition during long spells of dry weather when grass was very scarce.

It is desirable that more attention should be paid to these valuable plants.

YEERONGPILLY STOCK DISEASES EXPERIMENT STATION.

Collection of specimens illustrative of the various diseases (common and obscure) of cattle, sheep, horses, pigs, and other animals. These include tuberculosis, actinomycosis, pleuro pneumonia, tick fever, contagious miamitis, strangles, blackleg, swine fever, &c.

Another interesting section is that dealing with certain investigations into the souring of hams and bacon, commonly known to butchers as bone taint. This very serious trouble is caused by a specific germ, a spore-bearing bacillus.

This germ will grow readily in the absence of fresh air, and at very low temperatures. During its growth in and around the bone it generates gas. This was well seen in the culture tubes of pork gelatine media. Coloured drawings of this bacillus were also shown.

A special feature is made of blackleg vaccine, prepared at the Laboratory at Yeerongpilly, and where the closest scrutiny is given to the instruction supplied with each lot of vaccine, 100 per cent. results are obtained.

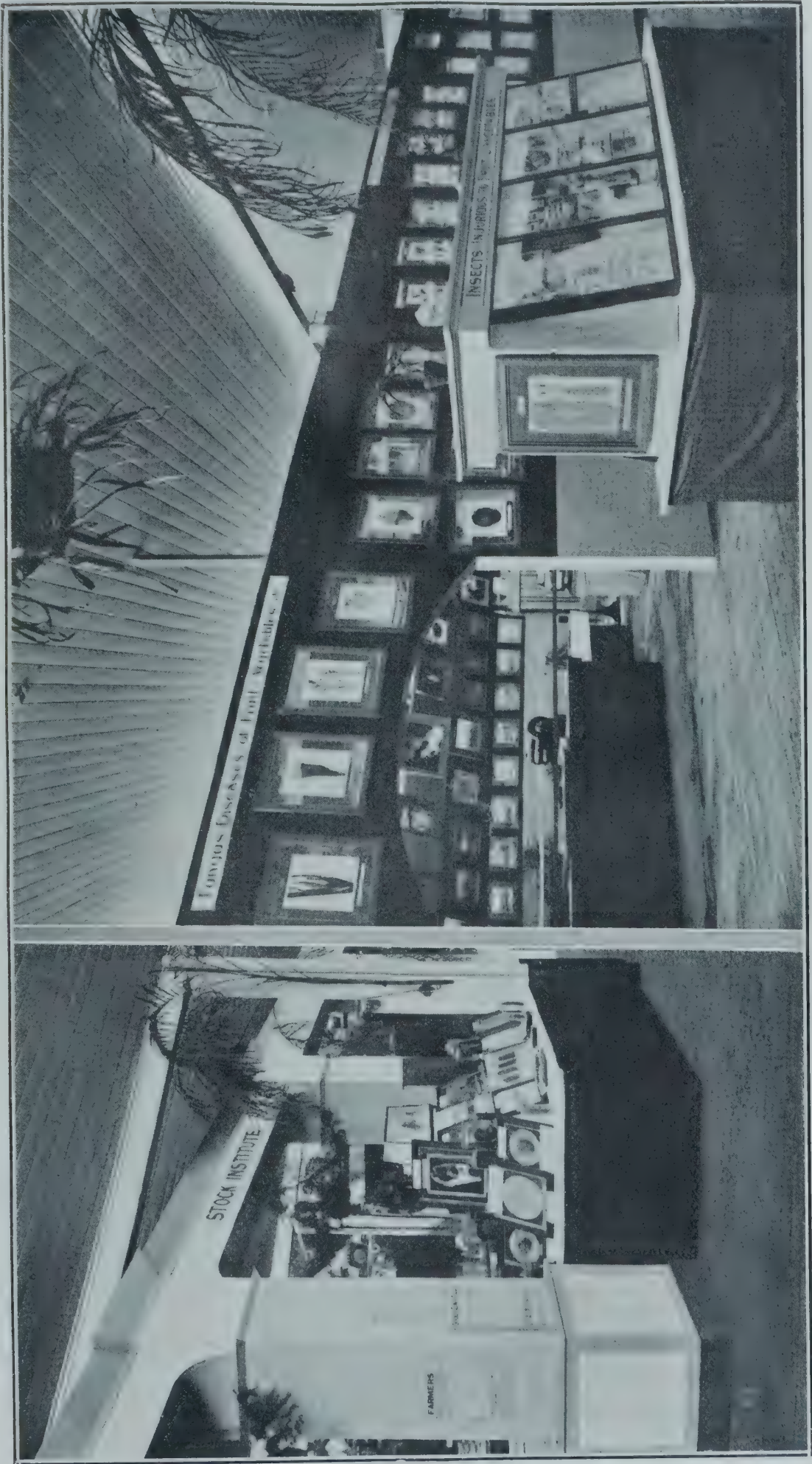


PLATE 20.—EXHIBITS OF THE STOCK INSTITUTE AND PORTION OF THE ENTOMOLOGICAL EXHIBIT.

During the past seven years, of 45,000 calves treated with this vaccine, only thirty animals were reported to have died subsequently from blackleg disease.

An interesting and instructive part of the exhibit was that dealing with the progress of tick eradication in the United States of America. This comprised several coloured maps showing the country originally tick-infested, and that cleaned up during the past eleven years. On 1st July, 1906, there were 728,565 square miles tick infested, and on 1st December, 1917, 379,312 square miles, or more than one-half, were released from quarantine restriction.

Other exhibits of the Laboratory were specimens of pure cultures of lactic acid bacteria for the purpose of making starters to be used in the manufacture of cheddar cheese; also cultures of penicillium mould, used in the manufacture of stilton and similar cheeses.

CORNGROWING COMPETITION.

Amongst the main staples of agricultural production in Queensland, next to sugar, maize is one which, considering the large area of the State in which this cereal can be profitably produced, should take a high place. It may truly be said that the maize-belt means the whole State. Hence, it is a universal crop with farmers in all parts, be the climate temperate, sub-tropical, or tropical. It is practically the first crop a farmer can plant on newly-cleared scrub land, and yields good returns even when its cultivation on such lands demands laborious hoe work. On all the coast lands, on the rich hillsides of the Dividing Ranges, and over the whole vast extent of the Darling Downs, away out towards Cunnamulla and Thargomindah, on the Maranoa, the Fitzroy, the Mary, the Gilbert, and the Barron Rivers, away out at Camooweal—in fact, everywhere—maize is king. Vast quantities are raised in the Far North on the Atherton scrub lands. Notwithstanding the indisputable fact that climatic conditions are everywhere favourable to the production of heavy crops, what do the statistics published year after year reveal as to the average yield of maize throughout the State? In 1916 the average was only 16.64 bushels per acre. During the ten years from 1907 to 1916, the highest average yield was 24.97 bushels in 1913; in 1909 and 1915, the average was recorded to be 18.96 and 13.68 bushels per acre, respectively. The highest total production for any single year amounted to 4,260,073 bushels in 1914 from 176,372 acres, the average being 24.16 bushels per acre.

With the object, *inter alia*, of increasing the per acre yield of this important crop, the Department of Agriculture and Stock, in 1914, inaugurated a corngrowing competition to encourage an interest in the improvement of our methods of maize cultivation, and, as a preliminary, the co-operation of the school children of the farming districts of the State was enlisted. This competition was open to all under the age of eighteen years who were resident in Queensland. Competitors had absolute freedom as to the choice of ground and cultivation methods. The department supplied the necessary seed, which was of the same variety in each district. Prizes valued at £5, £2, and £1 were given for each district, with special prizes to the value of £10, £5, and £3, which were to be awarded to the competing growers who should stand first, second, and third in the entire competition. The response was excellent, not less than 296 nominating themselves, amongst whom were 15 girls.

Notwithstanding the bad climatic conditions after the competition grain was planted, some very good yields resulted, as much as 92 bushels per acre having been reached, and other competitors produced from 31 to 69 bushels. In the second year's competition, which was keenly contested, the returns ranged from 39 to 92 bushels per acre. Still higher records are shown as a result of the competition in 1916-1917, several of the juvenile growers raising over 100 bushels up to 107 bushels per acre. Taken as a whole, this year's (1918) competition has been the most satisfactory of any yet held, the yield being exceptionally high (as much as 169 bushels per acre) as will be seen by the following table of results:—

Out of 136 competitors who planted up their plots 67 compiled with the rules and regulations. Taken as a whole, this year's competition has been the most satisfactory of any yet held, as the yields are exceptionally high throughout. A summary of the yields is as follows:—2 plots returned from 30 to 40 bushels per acre; 4, 40 to 50 bushels; 6, 50 to 60 bushels; 14, 60 to 70 bushels; 8, 70 to 80 bushels; 3, 80 to 90 bushels; 10, 90 to 100 bushels; 6, 100 to 110 bushels; 5, 110 to 120 bushels; 5, 120 to 135.9 bushels; 3, 145 to 169.6 bushels. (No yields were recorded between 135.9 and 145 bushels per acre.) The average yield for the competition plots is 83.5 bushels, whilst that of the State is under 25 bushels per acre.

Mr. H. C. Quodling (Director of Agriculture) states that the returns in these competitions for the last four years show a distinct average rise, thus demonstrating the advantage of using high-class seed in order to improve production. The average yield in the competition in 1914-15 was 39.3 bushels per acre; this rose to 51.3 bushels in 1915-16, then to 62.2 bushels in 1916-17, and now to 85.3 bushels in 1917-18.

Prizes were offered for the yield per acre, quality of the grain, and uniformity of ear, and the keeping of records showing field data. Following were the results:—



PLATE 21.—MAIZE EXHIBITS, INCLUDING MANUFACTURES FROM MAIZE.



PLATE 22.—GENERAL AGRICULTURAL EXHIBIT INCLUDING FLOWERS, FRUITS, VEGETABLES, AND PLANTS.

JUVENILE CORNGROWING COMPETITION, 1917-18.

Out of 136 competitors who planted up their plots, 67 complied with the rules and regulations.

Taken as a whole this competition has been the most satisfactory of any yet held, as the yields are exceptionally high throughout.

A summary of the yields is as follows:—

2 plots returned from	30 to 40	bushels per acre.
4 plots returned from	40 to 50	bushels per acre.
6 plots returned from	50 to 60	bushels per acre.
14 plots returned from	60 to 70	bushels per acre.
8 plots returned from	70 to 80	bushels per acre.
3 plots returned from	80 to 90	bushels per acre.
10 plots returned from	90 to 100	bushels per acre.
6 plots returned from	100 to 110	bushels per acre.
5 plots returned from	110 to 120	bushels per acre.
5 plots returned from	120 to 135.9	bushels per acre.
3 plots returned from	145 to 169.6	bushels per acre.

(No yields were recorded between 135.9 and 145 bushels per acre.)

The average yield for the competition plots is 83.5 bushels, whilst that of the State is under 25 bushels per acre respectively.

RESULTS OF THE COMPETITION.

SPECIAL PRIZES.

Name and Address.	Age.	Yield per Acre in Bushels.	Points Awarded for Yield. Maximum Points, 75.	Quality of Grain and Uniformity of Ear. Maximum Points, 15.	Records. Field Data, 10 Points.	Total Maximum Points, 100.	District Prize.
No 4 District—							
E. V. E. Burton, Boobie ..	18	169.6	74.8	8.6	6.0	89.4	1st, £10
No. 5 District—							
G. E. Gon Chee, Killarney ..	16	153.3	67.6	10.1	5.5	83.2	2nd, £5
No. 5 District—							
Hector Gon Chee, Killarney ..	18	145.1	64.0	10.3	5.5	79.8	3rd, £3

DISTRICT PRIZES.

DISTRICT No. 1.

A. G. Marks, Alberton.. ..	14 $\frac{1}{2}$	113.9	50.2	10.6	9.0	69.8	1st, £5
L. S. Rachow, Alberton ..	13 $\frac{1}{2}$	74.4	32.8	10.2	6.0	49.0	2nd, £2
W. O. Griffiths, Mount Forbes	15 $\frac{1}{4}$	63.0	27.1	10.0	6.0	43.1	Divided 3rd Prize, £1
R. H. Morrisen, Purga, <i>via</i> Ipswich	13	68.9	30.3	9.3	3.5	43.1	
E. Prenzler, Kulgun	16 $\frac{1}{4}$	51.4	22.6	10.1	7.5	40.2	..
N. Kriedmann, Alberton ..	10 $\frac{1}{2}$	63.9	28.1	9.8	2.0	39.9	..

DISTRICT No. 2.

A. H. Sims, Gheerulla, Eumundi	11 $\frac{1}{4}$	109.6	48.4	11.0	8.0	67.4	1st, £5
Isabella Guldbransen, Samford	18	111.9	49.3	10.3	3.5	63.1	2nd, £2
A. H. Pickering, Gheerulla, Eumundi	14	105.6	46.5	11.0	4.0	61.5	3rd, £1
R. H. Pickering, Oakey Creek, Eumundi	14	98.2	43.3	10.2	5.0	58.5	..
S. A. McGinn, Oakey Creek, Eumundi	16	94.3	41.5	10.6	4.5	56.6	..
W. S. Bray, Lawnton	13 $\frac{3}{4}$	78.4	34.5	11.6	3.5	49.6	..
W. Guldbransen, Samford ..	16 $\frac{1}{2}$	80.1	35.3	9.8	3.5	48.6	..
J. S. Bray, Lawnton	15 $\frac{1}{4}$	72.9	32.1	11.5	3.5	47.1	..
August Reck, Coominya ..	14 $\frac{1}{2}$	74.3	32.7	10.5	3.0	46.2	..
Geo. Thorpe, Mount Pleasant	15	67.2	29.6	9.6	3.0	42.2	..

DISTRICT No. 3.

Geo. Jannusch, Haden	17 $\frac{1}{2}$	123.0	54.2	10.5	5.5	70.2	1st, £5
H. Thies, Pinelands, Crow's Nest	14	120.4	53.1	10.5	6.0	69.6	2nd, £2
H. Morgenstein, Pinelands ..	15	119.5	52.7	11.0	4.5	68.2	3rd, £1
Hermann Jannusch, Haden ..	16 $\frac{1}{2}$	110.4	48.7	10.6	5.0	64.3	..
L. Smallbone, Pinelands ..	17 $\frac{1}{2}$	94.5	41.6	10.2	7.0	58.8	..
William Jannusch, Haden ..	13 $\frac{1}{2}$	100.1	44.1	9.8	4.0	57.9	..
D. H. Bade, Ma Ma Creek ..	14	99.7	43.9	9.7	4.0	57.6	..

RESULTS OF THE COMPETITION—*continued.*SPECIAL PRIZES—*continued.*

Name and Address.	Age.	Yield per Acre in Bushels.	Points Awarded for Yield, Maxi- mum Points, 75.	Quality of Grain and Uniformity of Ear, Maxi- mum Points, 15.	Records, Field Data, 10 Points.	Total Maximum Points, 100.	District Prize.
DISTRICT NO. 3— <i>continued.</i>							
E. F. Smallbone, Pinelands, Crow's Nest	13 $\frac{3}{4}$	96.3	42.4	10.3	4.5	57.2	..
C. Dow, Ma Ma Creek, Grantham	13	63.5	28.0	10.2	2.0	40.2	..
DISTRICT NO. 4.							
E. V. E. Burton, Booie ..	18	169.6	74.8	8.6	6.0	89.4	1st, £5
W. J. Maynard, Goodger, Kin- garoy	15	133.4	58.8	10.2	6.5	75.5	2nd, £2
S. L. Marshall, Wooroolin ..	14 $\frac{3}{4}$	111.3	49.1	10.7	7.0	66.8	3rd, £1
Eli W. Hayden, Booie ..	..	99.9	44.0	10.2	6.0	60.2	..
Arthur Gray, Wooroolin ..	14 $\frac{3}{4}$	98.2	43.3	9.7	4.5	57.5	..
Helen Franklin, Coolabunia ..	18	90.3	39.8	11.1	3.0	53.9	..
J. F. Wyvill, Yarraman Creek	16 $\frac{1}{4}$	84.2	37.1	9.7	6.0	52.8	..
W. G. Wyvill, Yarraman Creek	13	77.2	34.0	10.2	6.0	50.2	..
G. H. Maynard, Goodger, King- aroy	14	81.3	35.8	10.0	4.0	49.8	..
R. E. Pickles, Coolabunia ..	14	73.6	32.4	10.2	4.0	46.6	..
Theo. Howell, Wondai ..	12 $\frac{3}{4}$	52.7	23.2	10.2	4.5	37.9	..
W. H. Simpson, Eden Vale, Kingaroy	13 $\frac{3}{4}$	54.2	23.9	9.5	3.0	36.4	..
J. L. Horne, Goomeri ..	16 $\frac{1}{4}$	43.5	19.1	9.6	4.0	32.7	..
DISTRICT NO. 5.							
G. E. Gon Chee, Killarney ..	16	153.3	67.6	10.1	5.5	83.2	1st, £5
Hector Gon Chee, Killarney ..	18	145.1	64.0	10.3	5.5	79.8	2nd, £2
Willie Gon Chee, Killarney ..	13 $\frac{3}{4}$	135.9	59.9	10.3	3.0	73.2	3rd, £1
Isabella Wilkie, Killarney ..	13	105.5	46.5	11.1	7.0	64.6	..
T. C. Williams, Plainby ..	15 $\frac{1}{2}$	112.1	49.6	10.0	3.5	62.9	..
P. C. Arthur, Plainby ..	14	67.5	29.7	10.1	3.5	43.3	..
A. E. Masters, Goomburra ..	13	61.4	27.0	10.4	4.7	41.4	..
R. Harland, Plainby ..	9	66.9	29.5	9.8	2.0	41.3	..
J. J. Gallagher, Clifton ..	11 $\frac{3}{4}$	64.7	28.5	9.7	2.0	40.2	..
E. Ardron, Goomburra ..	14 $\frac{1}{4}$	57.8	25.5	10.2	2.0	37.7	..
DISTRICT NO. 6.							
F. H. Lieberam, Gurgeena ..	17	104.4	46.0	11.3	4.5	61.8	1st, £5
E. E. Lieberam, Gurgeena ..	15 $\frac{1}{2}$	98.1	43.2	11.0	4.5	58.7	2nd, £2
J. D. Sandow, Binjour Plateau	15 $\frac{1}{2}$	69.1	30.4	9.8	2.5	42.7	3rd, £1
Fritz Eggerling, Mundowran ..	16	65.9	29.0	9.8	2.0	40.8	..
Chas. Eggerling, Mundowran	12 $\frac{3}{4}$	65.9	29.0	9.7	2.0	40.7	..
Richard Eggerling, Mundowran	11 $\frac{1}{2}$	64.9	28.6	9.8	2.0	40.4	..
A. Bjorndahl, Reid's Creek, Gayndah	14	40.0	17.6	10.1	2.0	29.7	..
DISTRICT NO. 7.							
E. C. Hartland, Rosalie Plains	12 $\frac{3}{4}$	75.5	33.3	10.6	4.0	47.9	1st, £5
M. M. Steger, Evergreen, <i>via</i> Oakey	14 $\frac{1}{2}$	70.7	31.1	10.0	2.5	43.6	2nd, £2
A. J. Beitz, Roma ..	13	59.4	26.2	9.8	4.5	40.5	3rd, £1
W. York, Wallumbilla ..	14 $\frac{1}{2}$	41.1	18.1	10.0	5.5	33.6	..
G. E. Regan, Roma ..	16 $\frac{3}{4}$	33.2	14.6	9.4	4.5	28.5	..
P. Kieseker, Roma ..	16 $\frac{1}{2}$	35.6	15.7	9.6	2.0	27.3	..
DISTRICT NO. 8.							
Mary Wilson, Yeppoon ..	16 $\frac{1}{2}$	63.8	28.1	11.1	4.0	43.2	1st, £5
W. B. Philp, Mount Larcom ..	17	48.6	21.4	9.6	4.0	35.0	..
DISTRICT NO. 9.							
H. C. Downs, Tarzali ..	12	129.7	57.2	9.6	4.0	70.8	1st, £5
K. E. Downs, Tarzali ..	13 $\frac{1}{2}$	100.8	44.4	9.6	3.5	57.5	2nd, £2
I. G. Downs, Tarzali ..	10 $\frac{1}{2}$	97.5	43.0	9.5	3.5	56.0	..
H. C. Mazlin, Atherton ..	7 $\frac{1}{4}$	55.7	24.5	10.4	3.0	37.9	..

The steady progress shown in the above results of the corn-growing competition affords ample evidence of their great value. Similar competitions have had a stimulating effect in the largest maize-producing country in the world—viz., the United States of America—and it is almost certain that they will have a similar beneficial result in Queensland. A writer in the Brisbane "Daily Mail" alluding to the Juvenile Corn-growing Competition, says:—

"In maizegrowing, on account of it being so easily cross-fertilised, special attention must be given to the care of seed. The truth of this is shown by the experience in this State under the old system of experiments carried out by the school teachers, who often tested different varieties in a small plot, and consequently the seed became mixed. This result could only be expected. Much more valuable have been the boys' maize competitions, which have been so successful in Queensland and which should be encouraged in every way possible. Not only have splendid yields been obtained, in some cases phenomenal—as much as 135 bushels per acre being obtained, as compared with the average of the State of between 21 and 22 bushels—but the competitions have aroused keen interest amongst the older folks, and thus led to improved methods on the farms. Those who desire to encourage better methods of farming in as far as maizegrowing is concerned in this State could not find a better means of doing so than by assisting these competitions. The success that has accompanied the Boys' Corn Clubs in the United States is famous, and the same lines should be followed here. Not only is the younger generation more plastic material to work than the older, already settled in the ways of a lifetime, but the education of the latter, bringing with it practical and inescapable results, have their effect upon all but the most hidebound of fathers, and gradually the methods learnt and proven by the boy's experience are adopted on his father's farm. The more young Queenslanders we have taking part in these maizegrowing competitions, the higher will be the average yield of this crop in this State in ten years' time."

DISTRICT EXHIBITS.

A AND B GRADES.

The district exhibits in many items showed remarkable improvement over those of previous years. As Mr. John Reid, chief steward of the section, said at the distribution of the prizes, these exhibits were doing good work by increasing the number of men on the land, and also had the effect of drawing attention to Queensland land. They afforded educational advantages for the thousands of people who visited the Show. Special reference was made by Mr. Cadell to the Darling Downs exhibit, but all were the finest he had seen.

Before distributing the prizes, the chairman (Mr. John Macdonald) said that, according to schedule, if there were fewer than four competitors, the prize money totalled £250. The association, however, was satisfied, and would distribute £300 amongst the A Grade exhibitors. The prize money had been worked out on points, and had been allotted as follows:—A Grade: Darling Downs, £111 3s. 10d.; Wide Bay and Burnett, £99 8s. 7d.; Central Queensland, £89 7s. 7d.; total, £300. B Grade: Crow's Nest, £69 10s. 2d.; Gympie, £63 8s. 6d.; Wallumbilla, £61 11s. 10d.; Kingaroy, £54 14s. 7d.; Northern Downs, £50 14s. 11d.; total, £300. The Chairman then handed to the representatives cheques for the amounts stated, and also handed to the district fruit exhibit representatives cheques as follows:—Landsborough and Caboolture, £37 18s.; Palmwoods, £37 2s. To Mr. Nystrom he handed a cheque for £50.

Mr. R. S. Archer (president of the Rockhampton Agricultural Society) proposed the toast of the winners, and said it was no disgrace to Wide Bay and Burnett and Central Queensland to be beaten by the Darling Downs.

This year, the Northern Rivers (N.S.W.) were not represented, and it was suggested that an interstate competition be organised by the Royal Agricultural Society, Sydney, and the National Association, Brisbane, in conjunction. This would attract people from all over the Commonwealth.

ONE-FARM EXHIBIT.

Last year there were three competitors, Mr. O. C. Williams, of Crow's Nest, Mr. J. A. Nystrom, of Boogie, Kingaroy, and Mr. Allan, of Gympie. In that year, as in the previous year, Mr. Williams was successful. On this occasion Mr. Nystrom was the only exhibitor. Judging by the variety and excellence of his display, he thoroughly understands how to make the most of the capabilities of his land, and any other competitors would have had a hard tussle to wrest the prize from him. The prize was very deservedly awarded to him.

In the course of an interview with the Press representatives, Mr. J. Bain, Secretary of the National Association, said that he regarded the whole Show as

having been an unqualified success, and his feelings of gratification were shared by the members of the Association's Council. To this we may add that Mr. Bain's share in the achieved success, has, as shown by previous exhibitions during his tenure of office, very largely contributed, owing to his tireless energy, forethought, and courtesy to exhibitors and to the public. He further said, speaking of the district and one-farm exhibits:—

“Only those intimately connected with the promotion of district and one-man-farm exhibits have the faintest conception of the colossal work which these exhibits entail upon a few individuals. Were this known, even to a minor degree, they would necessarily feel compelled to admire the splendid workers who have staged the displays which we have on view to-day. We are more than pleased to again welcome Central Queensland after an absence of several years, and trust that this visit will only be a forerunner of another one, where the experience gained at this Show will be of such a nature that they will be enabled to carry off the blue. Strong efforts will be made next year to go even further afield. We hope to receive an exhibit from the Atherton Tableland and Cairns districts. The promotion of these exhibits has already started, and the assurance has been given that Bowen will be represented next year.”

BUTTER AWARDS.

EXPORT CLASSES.

The competition in the thirty-days' class was very keen amongst the twenty-seven competitors, amongst whom were several interstate factories. The first prize was awarded to the North Coast Co-operative Dairy Co., Ltd., Murwillumbah, which obtained 94 points out of the possible 100. The Downs Co-operative Dairy Co., Ltd., Toowoomba, was a close second with 93½ points, while another New South Wales concern, Dungog Co-operative Butter Factory, Ltd., was third with 93 points. The other factories' points ranged from 91½ down to 84. In the six weeks' storage class, Dungog, New South Wales, Co-operative Butter Factory was first with 95 points. the Downs Co-operative Dairy Co., Ltd., Toowoomba, second with 94, and Wide Bay Co-operative Dairy Co., Ltd., Gympie factory, third, with 93½ points. There were twenty-six entries in this class—the North Coast Co-operative Dairy Co., Ltd., was not a competitor. The other factories' points ranged from 92½ down to 86. In the eight-weeks' storage class, Dungog Co-operative Butter Factory, Ltd., New South Wales, was again first with 95 points, and the Downs Co-operative Dairy Co., Ltd., Toowoomba, was for the third time placed second with 94 points. The Maleny Co-operative Dairy Co., Ltd., with 93½ points was third, and the Queensland Farmers' Co-operative Co., Ltd., Laidley factory, fourth with 92½.

ONE BOX, THIRTY DAYS' STORAGE.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
North Coast Co-operative Dairy Co., Ltd., Murwillumbah	60	19½	6½	4	4	94
The Downs Co-operative Dairy Co., Ltd., Toowoomba	59½	19½	6½	4	4	93½
Dungog Co-operative Butter Factory, Ltd., Dungog, N.S.W.	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Grantham	57½	19½	6½	4	4	91½
Queensland Farmers' Co-operative Co., Ltd., Booval	57	19½	6½	4	4	91
The Downs Co-operative Dairy Co., Ltd., Dalby	57½	18½	7	4	4	91
The Wide Bay Co-operative Dairy Co., Ltd., Gympie	57	19½	7	4	3½	91
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	57	19	6½	4	4	90½
Queensland Farmers' Co-operative Co., Ltd., Boonah	57	19	6½	4	4	90½
North Coast Co-operative Dairy Co., Ltd., Tweed Heads	56½	19½	6½	4	4	90½

ONE BOX, THIRTY DAYS' STORAGE—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible Points	65	20	7	4	4	100
Queensland Farmers' Co-operative Co., Ltd., Laidley	56	19	7	4	4	90
North Coast Co-operative Dairy Co., Ltd., Uki, N.S.W.	56	19½	6½	4	4	90
Caboolture Co-operative Dairy Co., Ltd.	56	19	7	4	3½	89½
Gayndah Co-operative Dairy Co., Ltd. ..	56	19	6½	4	4	89½
Maleny Co-operative Dairy Co., Ltd. ..	56	19	6½	4	4	89½
The Warwick Butter and Dairy Co., Ltd., Allora	56	19	7	4	3½	89½
Singleton, N.S.W., Central Co-operative Dairy Co., Ltd.	56	18	6½	4	4	88½
MacLagan Co-operative Dairy Co.	54	19	7	4	4	88
The Warwick Butter and Dairy Co., Ltd., Texas	55½	19	6½	3	4	88
The Logan and Albert Co-operative, Beaudesert	55	18½	6½	4	3½	87½
Goombungee Co-operative Dairy Co., Ltd.,	55	18	6	4	4	87
Killarney Dairy Co., Ltd.	55	18	6	4	3½	86½
Kin Kin Co-operative Dairy Co., Ltd. ..	54	19	6	4	3½	86½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	54	19	6½	4	3½	86
Maryborough Co-operative Dairy Co., Ltd., Biggenden	53	19	6	4	3½	85½
Oakey District Co-operative Butter Co.,	53	18	6	4	3½	84½
Terror's Creek and Samson Vale Dairy Co., Ltd., Dayboro	53	18	6	3½	3½	84

ONE BOX, SIX WEEKS' STORAGE.

Dungog (N.S.W.) Co-operative Butter Factory, Ltd.	60	20	7	4	4	95
The Downs Co-operative Dairy Co., Ltd., Toowoomba	59½	19½	7	4	4	94
The Wide Bay Co-operative Dairy Co., Ltd., Gympie	59	20	7	4	3½	93½
The Downs Co-operative Dairy Co., Ltd., Clifton	58	19½	7	4	4	92½
The Warwick Butter and Dairying Co., Ltd., Allora	57½	20	7	4	4	92½
MacLagan Co-operative Dairy Co.	58	19½	7	4	3½	92
Singleton Central Co-operative Dairy Co., Ltd.	58	18½	6½	4	4	91
The Warwick Butter and Dairying Co., Ltd., Warwick	57	19½	6½	4	4	91
Gayndah Co-operative Dairy Co., Ltd. ..	57	19	6½	4	4	90½
Queensland Farmers' Co-operative Ltd., Laidley	57	18½	6½	4	4	90
Maleny Co-operative Dairy Co., Ltd. ..	56	19	7	4	4	90
The Downs Co-operative Dairy Co., Ltd., Dalby	57	19	6½	3½	4	90
Queensland Farmers' Co-operative, Ltd., Boonah	55	19½	6½	4	4	89
Kin Kin Co-operative Dairy Co., Ltd. ..	56	18½	6½	4	4	89
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	55	19	6½	4	4	88½
The Warwick Butter and Dairying Co., Ltd., Texas	54	19½	7	4	4	88½
The Queensland Farmers' Co-operative Dairy Co., Ltd., Booval	55	19	6	4	4	88
Killarney Dairy Co., Ltd.	54	19	6½	4	4	87½

ONE BOX, SIX WEEKS' STORAGE—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Queensland Farmers' Co-operative, Ltd., Grantham	54	19	6½	4	4	87½
Caboolture Co-operative Dairy Co., Ltd.	53	19½	6½	4	4	87
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	55	18	6	4	3½	86½
The Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	53½	19	6	4	4	86½
Terror's Creek and Samson Vale Dairy Co., Ltd., Dayboro'	55	18	6	4	3½	86½
Maryborough Co-operative Dairy Co., Ltd., Biggenden	53	18½	6½	4	4	86
Goombungee Co-operative Dairy Co., Ltd.	54	18	6½	4	3½	86
Oakey District Co-operative District But- ter Co., Ltd.	53	18	6½	4	4	85½

ONE BOX, EIGHT WEEKS' STORAGE.

Dungog, N.S.W., Co-operative Butter Factory, Ltd.	60	20	7	4	4	95
The Downs Co-operative Dairy Co., Ltd., Toowoomba	59½	19½	7	4	4	94
Maleny Co-operative Dairy Co., Ltd. ..	59	19½	7	4	4	93½
Queensland Farmers' Co-operative Co., Ltd., Laidley	58	19½	7	4	4	92½
MacLagan Co-operative Dairy Co., Ltd., Singleton, N.S.W., Central Co-operative Dairy Co., Ltd.	57½	19½	7	4	4	92
Gayndah Co-operative Dairy Co., Ltd.	57	19½	7	4	4	91½
Downs Co-operative Dairy Co., Ltd., Clifton	57	20	7	4	3½	91½
The Warwick Butter and Dairying Co., Ltd., Texas	57	20	7	4	3½	91½
Queensland Farmers' Co-operative, Ltd., Booval	57	19	7	4	4	91
Queensland Farmers' Co-operative, Ltd., Boonah	57	19	7	4	4	91
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	56½	19	7	4	4	90½
Downs Co-operative Dairy Co., Ltd., Dalby	56½	19	7	4	4	90½
Goombungee Co-operative Dairy Co., Ltd.	56	19	7	4	4	90
Wide Bay Co-operative Dairy Co., Ltd., Gympie	56½	19½	6½	4	3	89½
Queensland Farmers' Co-operative Co., Ltd., Grantham	55	19	6½	4	4	88½
Caboolture Co-operative Dairy Co., Ltd.	54	19½	7	4	4	88½
Stanley River Co-operative Butter Co., Ltd., Woodford	56	18½	6	4	4	88½
The Warwick Butter and Dairying Co., Ltd., Allora	54	19	7	4	4	88
Oakey District Co-operative Butter Co., Ltd.	54	18½	6½	4	4	87
The Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	53	19	6½	4	4	86½
Kin Kin Co-operative Dairy Co., Ltd. ..	55	18½	6	4	3	86½
Maryborough Co-operative Dairy Co., Ltd., Mundubbera	54	18	6	4	4	86
Terror's Creek and Samson Vale Dairy Co., Ltd., Dayboro	54	18	6	4	4	86
Warwick Butter and Dairy Co., Ltd., Warwick	53	18½	6	4	4	85½

ONE BOX FRESH FACTORY MADE, FOR LOCAL CONSUMPTION.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible Points	65	20	7	4	4	100
Queensland Farmers' Co-operative, Boonah	60	19½	7	4	4	94½
Logan and Albert, Beaudesert	60	19	7	4	4	94
Queensland Farmers' Co-operative, Booval	58½	19½	7	4	4	93
Wide Bay Co-operative, Gympie	59	19½	7	4	3½	93
North Coast Co-operative, Tweed Heads..	58	20	7	3½	4	92½
Queensland Farmers' Co-operative, Grantham	58	19	7	4	4	92
Maryborough Co-operative, Kingaroy ..	58	19½	6½	4	4	92
North Coast Co-operative, Uki	58	19½	6½	4	4	92
Caboolture Co-operative Co.	58½	19	7	4	3½	92
Dungog (N.S.W.) Co-operative	57	19½	7	4	4	91½
Goombungee Co-operative	57	19½	7	4	4	91½
MacLagan Co-operative	58½	19	6½	4	3½	91½
North Coast Co-operative, Murwillumbah	57½	19½	6	4	4	91
Queensland Farmers' Co-operative, Laidley	57	18½	7	4	4	90½
Downs Co-operative, Toowoomba	55	20	7	4	4	90
Warwick Co-operative, Warwick	56½	19½	6½	3½	4	90
Warwick Co-operative, Allora	56½	19½	6½	3½	4	90
Singleton Central Co-operative	56	19	6½	3½	4	89
Gayndah Co-operative	55	19	6½	4	4	88½
Maleny Co-operative	55	19	6½	4	4	88½
Oakey District Co-operative	54	19	6½	4	4	87½
Kin Kin Co-operative	54	19	6½	4	3½	87
Maryborough Co-operative, Mundubbera..	55	18	6	3½	3½	86

Special prize (trophy, value £10 10s.), presented by Messrs. Henry Berry and Co. Proprietary, Limited, for one box salt butter, 56 lb., salted with Australian salt.

Queensland Farmers' Co-operative, Boonah	60	19½	7	4	4	94½
Logan and Albert, Beaudesert	60	19	7	4	4	94
Warwick Co., Texas	59	19	7	4	4	93
Queensland Farmers' Co-operative, Booval	58½	19	7	4	4	92½
Queensland Farmers' Co-operative, Grantham	58½	19	7	4	4	92½
Wide Bay Co-operative, Gympie	58	19	7	4	4	92
Goombungee Co-operative	57	19½	7	4	4	91½
MacLagan Co-operative	57½	19½	7	4	3½	91½
Queensland Farmers' Co-operative, Laidley	57	19½	6½	4	4	91
Downs Co-operative, Dalby	57	19	7	4	4	91
Warwick Co., Warwick	56	20	7	4	4	91
Downs Co-operative, Toowoomba	55	20	7	4	4	90
Warwick Co., Allora	55	20	7	4	4	90
North Coast Co-operative, Uki	56	19½	6½	4	4	90
North Coast Co-operative, Tweed Heads..	55	20	7	4	4	90
Dungog (N.S.W.) Co-operative	55	19½	6½	4	4	89
North Coast Co-operative, Murwillumbah	55	19½	6½	4	4	89
Maleny Co-operative	54	19½	7	4	4	88½
Gayndah Dairy Co.	54	19	6	4	4	87
Kin Kin Co-operative	54	19	6½	4	3½	87
Singleton Co-operative	55	18½	6	3	4	86½

Special Prize (£5 5s.) presented by the Farmers' Co-operative Distributing Co. of Queensland, for the factory securing the greatest aggregate number of points in all classes, and special prizes for butter.

						Total.
Dungog (N.S.W.) Co-operative .. ..	..	..	..	..	..	463½
Downs Co-operative, Toowoomba .. ..	..	..	..	..	..	461½

CHEESE.

There was an exceptionally heavy exhibit in this section, which was divided into six classes, besides a trophy competition. The judge, Mr. M. Wallace, had thus an arduous task to perform. Our space will not admit of the publication of the details of the award, but the results as to prize-winners were as follow:—

Greenmount Dairy Co., Ltd., A factory and B factory, were placed first and second in the two export cheese, white, 70-80 lb. with 95 and 94½ points respectively out of a possible 100. For the two export cheese, 70-80 lb., coloured, the Pittsworth Dairy Co.'s Springside factory with 94½ points was first, and Maclagan Valley Co. Dairy Co.'s Kaimkillenbun factory second with 93½ points. For the two medium cheeses, not exceeding 40 lb. over 2 and under 3 months old, there was a close decision, the Southbrook Co-operative Dairy Co. being placed first with 94½ points, Maclagan Valley Co-operative Dairy Co., Kaimkillenbun, second with 94 points, and the Warwick Butter and Dairying Co.'s, Ltd., Victoria Hill factory, and the Pittsworth Dairy Co.'s Springside factory equal, third, with 93½ points, with Tummaville Co-operative Co., Ltd., 90 points, close fourth. In two medium cheeses not exceeding 40 lb., over six weeks and under two months' old, Irongate Co-operative Dairy Co., Ltd., was first with 94½ points, Ramsay Dairy Co., Ltd. (*viâ* Cambooya), second, with 94, and Goombungee Dairy Co., Ltd., third, with 93½ points. It will thus be seen that right through the four classes the winning competitors not only obtained high points, testifying to the excellence of the cheese, but there was in all remarkably close competition. Details are as follows:—

ADDITIONAL AWARDS.

The judging of the remaining classes of the cheese section was concluded by Mr. M. Wallace. In the class for two loaf cheeses not exceeding 12 lb., over two months and under three, the first prize was awarded to Southbrook Co-operative Dairy Co., Ltd., with 95 points out of a possible 100. The judge noted in his book that the winning exhibit was the best cheese he had seen. The second and third places were gained respectively by the Ramsay Dairy Co., Ltd., with 94 points, and Pittsworth Dairy Co.'s Yarranlea factory, with 93½ points. Some of the other factories were very close up. In the class for two loaf cheeses not exceeding six weeks and under two months' old, Tummaville Co-operative Dairy Co., Ltd., was first with 93½ points, and Goombungee Co-operative Dairy Co., Ltd., second with 93 points. For the trophy of cheese there were five entries, and the judge gave the blue ribbon to the Rosalie Cheese Factory, Glencoe, with 98 points. Greenmount Co-operative Dairy Co.'s butter factory was second with 95 points, and Southbrook Co-operative Dairy Co., Ltd., third, with 94 points.

Two Export Cheeses, 70-80 lb., to be not more than three weeks' old prior to storing, white suitable for English market. Exhibits to be placed in cold stores six weeks prior to 12th August. First prize, £5 5s., presented by Mr. C. E. McDougall, Lyndhurst, Warwick.

Two loaf cheeses not exceeding 12 lb., age over two months and under three months.

					Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	..	..	..	..	50	25	15	10	100
Southbrook Co-operative	..	..	..	..	47	24½	14½	9	95
Ramsay Co.	..	..	..	..	46	24½	14	9½	94
Pittsworth Co., Yarranlea	..	..	..	..	45½	24½	14	9½	93½
Pittsworth Co., Pittsworth	..	..	..	..	45	23½	14	9½	92
Pittsworth Co., Springsure	..	..	..	..	44	23	14	9	90
Pittsworth Co., Scrubby	..	..	..	..	45	23½	14	9	91½
Dungog Co-operative	..	..	..	..	44	23½	13½	9	90
Irongate Co-operative	..	..	..	..	46	24	14	9	93
Mount Tyson Farmers'	..	..	..	..	43	23½	13½	9	89
Goombungee Co-operative	..	..	..	..	43	23½	14	9	89½
Southbrook Co-operative	..	..	..	..	45	23½	13½	9	91
Queensland Farmers' Co-operative, Rosevale	..	..	..	..	38	22	12½	8½	81
Greenmount A	..	..	..	..	45	22½	13½	8½	89½
Greenmount B	..	..	..	..	45	22½	13½	8½	89½
Gayndah Co-operative, Byrnestown	..	..	..	..	44	23	12	8	88
Rosalie Cheese Factory	..	..	..	..	44	22½	12½	9½	88½

Two loaf cheeses not exceeding 12 lb., age over two months and under three months—
continued.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Rosalie Cheese Factory	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{2}$
Warwick Co., Bony Mt.	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	89 $\frac{1}{2}$
Warwick Co., Victoria Hill	43	23	13 $\frac{1}{2}$	9	88 $\frac{1}{2}$
Warwick Co., Elbow Valley	45	24	13 $\frac{1}{2}$	8 $\frac{1}{2}$	91
Warwick Co., Talgai	43	23	13 $\frac{1}{2}$	9	88 $\frac{1}{2}$
Lauriston Co-operative	44	23 $\frac{1}{2}$	14	9 $\frac{1}{2}$	91
Biddeston Co-operative	42	23 $\frac{1}{2}$	14	9	88 $\frac{1}{2}$
Biddeston Co-operative	45	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	91
Downs Co-operative, Hodgson's Vale	44	23	13	9	89
Downs Co-operative, Koondai	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	89 $\frac{1}{2}$
Downs Co-operative, Westbrook	43	23	13	9	88
MacLagan Valley	45	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	90 $\frac{1}{2}$
Rock Creek	44	22 $\frac{1}{2}$	13	9	88 $\frac{1}{2}$
Tummaville Co-operative	45 $\frac{1}{2}$	24	13 $\frac{1}{2}$	9 $\frac{1}{2}$	92 $\frac{1}{2}$
Irongate Co-operative	46	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	92
Rosalie Factory, Jondaryan	45 $\frac{1}{2}$	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9 $\frac{1}{2}$	92
Sugarloaf Co-operative	46	24	14	9	93

Two loaf cheeses, not exceeding 12 lb., over six weeks and under two months old.

Tummaville Co-operative	46	24	14	9 $\frac{1}{2}$	93 $\frac{1}{2}$
Goombungee Co-operative	46	24	14	9	93
Pittsworth Co.	44	23	13 $\frac{1}{2}$	8 $\frac{1}{2}$	89
Pittsworth Co., Yarranlea	42	22	13 $\frac{1}{2}$	8 $\frac{1}{2}$	86
Pittsworth Co., Springside	44	23 $\frac{1}{2}$	14	9	90 $\frac{1}{2}$
Pittsworth Co., Scrubby	45	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	91
Pittsworth Co., Linthorpe	41	23	13 $\frac{1}{2}$	9	86 $\frac{1}{2}$
Dungog Co-operative	44	23	13 $\frac{1}{2}$	9	89 $\frac{1}{2}$
Irongate Co-operative	45	23	14	9	91
Mount Tyson Farmers'	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	90
Ramsay Co.	45 $\frac{1}{2}$	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	91 $\frac{1}{2}$
Standard Co., Wellcamp	41	22	12 $\frac{1}{2}$	8 $\frac{1}{2}$	84
Southbrook Co-operative	44	23	12 $\frac{1}{2}$	9	88 $\frac{1}{2}$
Queensland Farmers' Co-operative, Rosevale	38	21	13 $\frac{1}{2}$	8 $\frac{1}{2}$	80
Greenmount A Factory	44	23	13	8 $\frac{1}{2}$	88 $\frac{1}{2}$
Greenmount B Factory	45	23	13 $\frac{1}{2}$	9	90 $\frac{1}{2}$
Greenmount No. 1 Factory	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	90
Gayndah Co-operative, Glen Eden	43	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	88 $\frac{1}{2}$
Gayndah Co-operative, Byrnestown	45	23 $\frac{1}{2}$	12 $\frac{1}{2}$	8 $\frac{1}{2}$	89 $\frac{1}{2}$
Rosalie Factory, Glencoe	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9 $\frac{1}{2}$	90 $\frac{1}{2}$
Rosalie Factory, Glencoe	44	23 $\frac{1}{2}$	13	9 $\frac{1}{2}$	90
Warwick Co., Bony Mt.	44	23 $\frac{1}{2}$	13	8 $\frac{1}{2}$	89
Warwick Co., Victoria Hill	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	89 $\frac{1}{2}$
Warwick Co., Elbow Valley	45	23 $\frac{1}{2}$	13 $\frac{1}{2}$	8 $\frac{1}{2}$	90 $\frac{1}{2}$
Warwick Co., Talgai	44 $\frac{1}{2}$	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	90 $\frac{1}{2}$
Lauriston Co-operative	45	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	91
Biddeston Co-operative	44	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	90
Standard Co., Wellcamp	40	21	12	9	82
Downs Co-operative, Hodgson's Vale	45 $\frac{1}{2}$	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9 $\frac{1}{2}$	92
Downs Co-operative, Koondai	42	23 $\frac{1}{2}$	13	8 $\frac{1}{2}$	87
Downs Co-operative, Westbrook	43	23	13	8 $\frac{1}{2}$	87 $\frac{1}{2}$
MacLagan Co-operative, Kaimkillenbun	45	23 $\frac{1}{2}$	14	9	91 $\frac{1}{2}$
MacLagan Valley Co-operative	43	23	14	8 $\frac{1}{2}$	88 $\frac{1}{2}$
Rocky Creek Co.	43	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	89
Rosalie Factory, Jondaryan	43	23 $\frac{1}{2}$	13 $\frac{1}{2}$	9	89
Sugarloaf Co-operative	45	24	13 $\frac{1}{2}$	9 $\frac{1}{2}$	92

TROPHY OF CHEESE.

Rosalie Cheese Factory, Glencoe	98
Greenmount Co-operative Dairy Co., Ltd., B Factory	95
Southbrook Dairy Co., Ltd., Southbrook	94

MILKING TESTS.

THE RESULTS.

Judges—Messrs. R. W. Winks and L. Anderson.

COW, 4 YEARS OLD AND OVER, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

	Weight of Milk.	C. Butter.	No. of Points for Butter, 24 hours.	Lactation Points.	Total Points.
1. Henry Benbow's Joyce	122·8	5·903	48·5	..	48·5
2. D. Dunn's Blossom III of Valley View	82·15	4·95	39·6	7·1	46·7
3. M. Laurence's Charmer II of City View	89·11	4·337	34·7	..	43·9
B. O'Connor's Shamrock of Hillview ..	125·5	4·159	33·25	..	33·25
B. O'Connor's Charm of Glenthorn ..	139·6	5·061	40·5	..	40·5
F. L. Nott's Tot of Booran	89·5	3·280	26·25	1·5	27·75
Nestle and A.S.C.M. Co.'s Maggie II, of Numba	101·2	4·313	34·5	..	34·5
Paul Moore's Lovely of Sunnyside ..	108·1	4·643	37·15	..	37·15
W. F. Hamel's Ginger	81	3·17	25·35	8·1	33·45
Marquardt Bros.' Champion	71·9	3·362	26·9	10	36·9
P. Biddle's Handsome of Home Park ..	70·8	3·001	24	..	24

COW, 4 YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

1. Henry Benbow's Joyce	122·8	5·903	..	..	..
2. B. O'Connor's Charm of Glenthorn	139·6	5·001	..	..	..
3. D. Dunn's Blossom III of Valley View	82·15	4·95	..	..	..
Marquardt Bros.' Champion	71·9	3·362	..	..	..
F. L. Nott's Tot of Booran	89·5	3·28	..	..	..
M. Laurence's Charmer II of City View	89·11	4·337	..	..	..
Nestle and A.S.C.M. Co.'s Maggie II of Numba	101·2	4·313	..	..	..
D. Dunn's Jemima II of Valley View	94·13	3·284	..	..	..
Paul Moore's Lovely of Sunnyside ..	108·1	4·643	..	..	..
W. F. Hamel's Ginger	81	3·17	..	..	..
C. Bloss's May	62·15	3·949	..	..	..
B. O'Connor's Shamrock of Hillview ..	125·5	4·159	..	..	..
Biddle's Handsome of Home Park ..	70·8	3·001	..	..	..

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FOR 48 HOURS.

1. E. Burton's Oxford Golden Girl ..	77·1	3·557	..	..	..
2. W. T. Savage's Ruby of White Park	96·12	3·472	..	..	..
3. W. Middleton's Cherry of Devon Court	60	2·83	..	..	..
B. O'Connor's Narrell of Oakvale ..	70·1	2·693	..	..	..
B. O'Connor's Mona of Oakvale ..	49·10	2·175	..	..	..
W. F. Hamel's Fancy	55·8	2·75	..	..	..

COW OR HEIFER, UNDER 4 YEARS, AVERAGING THE GREATEST DAILY YIELD OF BUTTER FAT FOR 48 HOURS.

1. E. Burton's Oxford Golden Girl ..	77·1	3·557	28·45	3·9	32·35
2. B. O'Connor's Mona of Oakvale ..	49·10	2·175	17·4	10	28·4
3. W. T. Savage's Ruby of White Park	96·12	3·472	27·75	..	27·75
W. Middleton's Cherry of Devon Court	60	2·83	22·65	..	22·65
R. O'Connor's Narrell of Oakvale ..	70·1	2·693	21·5	4·8	26·3
W. F. Hamel's Fancy	55·8	2·715	21·7	4·8	26·5

COWYIELDING THE LARGEST SUPPLY OF MILK IN 48 HOURS.

	Weight of Milk.	C. Butter.	No. of Points for Butter, 24 hours.	Lactation Points.	Total Points.
1. B. O'Connor's Charm of Glenthorne	36.12	32.1	38.11	31.14	139.6
2. Henry Benbow's Joyce	32.12	28.4	31.8	30	122.8
3. Paul Moore's Lovely of Sunnyside..	28.1	26.8	28.6	25.2	108.1
*B. O'Connor's Shamrock of Hillview	34.4	29.13	31.8	29.12	125.5
Nestle and A.S.C.M. Co.'s Maggie II. of Numba	28.8	24.13	25.3	22.10	101.2
D. Dunn's Jemima II of Valley View..	29.8	22.6	22.1	20.14	94.13
D. Dunn's Blossom III of Valley View	27.8	19	18.11	17.12	82.15
W. F. Hamel's Ginger	21.4	19	20.2	20	81

*Judge's note stated butter fat contents of milk below that prescribed in schedule.

National champion butter fat test (Brisbane Newspaper Company's, Ltd., trophy), for cow (any breeding) averaging the greatest yield of butter for 48 hours :—

Henry Benbow's Joyce. Weight of milk, 122.8 ; commercial butter, 5.903.

BACON, HAMS, AND LARD.

In both these classes there was good competition, and the exhibits were shown to great advantage. They were judged by Mr. G. S. Stening, Sydney, who pronounced them to be generally excellent in quality. Details of the result were as follows:—

HAMS.

	Flavour.	Texture.	Fat and Lean.	B'chering.	Smoking.	Colour.	Total.
Possible points	45	10	10	10	10	15	100
HAMS, 6, factory cured—							
J. C. Hutton, Brisbane	41½	9½	9½	9½	9½	14	93½
J. C. Hutton, Brisbane	42	9½	9	9½	9½	13½	93
Q'land Co-operative, Murarrie ..	40½	9½	9	9½	9½	14½	92½
Q'land Co-operative, Murarrie ..	40½	9½	9	9½	9½	14½	92½
Q'land Co-operative, Murarrie ..	40½	9	9½	9½	9½	14½	92½
J. C. Hutton, Melbourne	42	9½	9	9	9	13½	92
D. Downs, Willowburn	39	9	9	9½	9	14	90
D. Downs	38	9	8½	9½	9	14	88

BACON.

	45	10	10	10	10	15	100
Possible points	45	10	10	10	10	15	100
BACON, 6 sides, factory cured—							
Q'land Co-operative, Murarrie ..	41½	9½	9½	9½	9½	14½	94
Q'land Co-operative, Murarrie ..	42	9½	9	9½	9	14	93
J. C. Hutton, Brisbane	42½	9	9	9	9	14	82½
Queensland Co-operative	41½	9½	8½	9½	9½	14	92½
J. C. Hutton, Brisbane	42½	9	8½	9	9	14	92
J. C. Hutton, Melbourne	41½	9½	8½	8½	9	14	91
D. Downs, Willowburn	38½	8½	8½	9½	9½	14	88½
D. Downs, Willowburn	38½	8½	8½	9	9	14	87½

LARD.
LARD IN BLADDERS, 14 LB.

	Flavour.	Texture.	Colour.	Appearance.	Total.
Possible points	40	25	25	10	100
J. C. Hutton, Brisbane	37	25	25	9	96
Queensland Co-operative, Murarrie	36	24½	23½	9½	93½
Queensland Co-operative	36	24	23	9½	92½
Queensland Co-operative	35	24½	24	9	92½

SAUSAGE, SMOKED, 14 LB.				
J. C. Hutton, Brisbane .. ..	..	..	..	1
Queensland Co-operative, Murarrie .. ..	..	..	..	2

SWINE AWARDS.

The cult of the pig is not the least important part of the dairy and general farmer's business. The most favoured animals of this class are, the Improved Berkshire, the Large Black, the Middle Yorkshire, the Essex, and the Tamworth. At one time, such breeds as the Prince Consorts, China-Poland, and other small blacks and whites were favoured, but of late years these latter have not been much in evidence, and have been conspicuous by their absence from urban and country shows. At this year's Show at Bowen Park, however, there were shown by an exhibitor from New South Wales three China-Poland sows of American origin. Of all breeds there were 141 entries. Details of the awards were as follows:—

For boars, Macfarlane Brothers secured champion, and Mr. W. J. Warburton's Northgate Queen was champion for sows. The same owner's Northgate Duchess was the champion of the Yorkshire breed, and Mr. D. W. Evans "scooped the pool" for Tamworths with his Knowles Queen.

The judge, Mr. H. M. Warburton, of Mittagong, New South Wales, said that the swine, generally speaking, were of excellent quality, and the numbers were considerably greater than in previous years. There was an all-round improvement on last year's exhibits, this being due, no doubt, to the increasing interest in this line. The Berkshires and Yorkshires were well to the fore, and there were some good specimens of the Tamworth breed, also Poland-China. It had been a very great pleasure to have before him such high-class animals.

DAIRY CATTLE.

Amongst the exhibitors of Ayrshires the first prize and the championship in the cow class was awarded to Jeannette III., the property of Mr. John Anderson, whilst Mr. J. H. Fairfax obtained second honours.

The Jerseys made a splendid display. An imported Jersey bull from Grasmere Jersey Stud, Merry Mike, took first honours in the aged class, and champion in his division. Larkspur, an imported cow exhibited by Messrs. W. and D. Carr, won first and championship.

In Holsteins (senior class for cow in milk) the first prize went to Mr. G. Neuman, of Wyreema, for his splendid cow Holly I. of St. Albans. In the senior bulls class Nestle's Farms took the first prize and the championship with Duke of Amsterdam.

In Guernseys the principal winner was Mr. G. H. Crowther.

The champion bull of the Illawarra breed was Diamond Boy of Blackland, owned by Mr. R. T. Ward. A typical milker, Charm of Glenthorne, carried off the championship for her owner, Mr. B. O'Connor.

The Herefords, in the opinion of good judges, could hardly be excelled in any part of the world. The prize for champion cow was carried off by Mr. James Sparkes, also Tindal, champion bull. The reserve champion in bulls went to Mrs. Lumley Hill, and the reserve in cows to Messrs. McConnel and Son.

Devons were few in number. Neither in North or South Devons was there any competition. Mr. J. T. Abbott carried off the prizes for the former, and Mr. T. A. Chirnside for the latter.

Aberdeen Angus were fairly represented and prizes were equally divided.

Only two exhibits of Sussex, a cow and a heifer, were present, both the property of Mr. Jas. T. Turner.

BEEF CATTLE.

The 1918 Brisbane Exhibition attracted a record in beef cattle, not only as regards numbers, but the improvement in quality was very marked; I do not think that a finer show of Shorthorns has ever been seen in Brisbane. The Lomas Pastoral Estates champion bull Grand Duke of Clifton was an exceptionally fine animal, very massive and full of quality, and would be hard to beat in any show ring in Australia. He competed here with some very fine specimens of the Shorthorn breed. The younger Shorthorns were generally very fine animals and bred from the best strains.

The Herefords, or ballys as they are commonly called, were a very strong and improved section this year, and there is no doubt that this breed is rapidly coming into favour. The champion Gunyan bull Magnitude was well named. He is an immense bull weighing over 1 ton 4 cwt., of great length and depth and remarkably well proportioned. There were many excellent cattle of this breed shown.

The Devons were a very fair lot.

The Aberdeen Polled Angus was well represented and there were a number of very fine cattle exhibited. Special mention might be made of Mr. J. A. McIntosh's first prize cow Annie Laurie, which is true to type and high class. This cow was bred by Mr. H. B. Williams, of New Zealand, who has sent quite a number of fine Angus cattle to Queensland.

The show sales of stud cattle were most interesting and instructive. There is no better judge than the buyer, and although prices were not quite so high or so uniform as last year, sellers of good quality cattle have every reason to be satisfied. Medium and plain cattle were rather hard to dispose of at sellers' values, but with a few exceptions they appeared to realise their market value.

Any cattle naturally immune or inoculated twice against tick fever were in good demand and easily sold. It seems that it would pay sellers to inoculate twice whenever possible before offering for sale.

Quite a number of stud cattle from the Southern States and New Zealand brought fair prices, although, by reason of the knocking about in transit, the majority of the animals were rather out of condition, and it behoves Southern breeders to get the condition hard on their stock before shipping if they wish to keep a bit of bloom on them for the sales. Some breeders were in the Brisbane market this year for the first time.

A new breed, South Devons, from Victoria, realised good prices. Young bulls brought up to 150 guineas and heifers to 131 guineas. These are great framed cattle, a little coarse in the bone, but there is plenty of frame to build the meat on. They were from imported stock and are said to be exceptionally heavy milkers and give a big return of butter. If so, these cattle should be the very thing to cross with our finer breeds to produce a dual purpose animal. It will be interesting to watch the result of crossing with this breed.

J. T.

COTTON INDUSTRY.

After many years of somnolence, the cotton industry shows abundant evidence of reviving, if one may judge by the relatively large quantity of cotton treated on farmers' account by the Department of Agriculture. Most of the agricultural sections at the Show made much use of cotton grown in many districts in decorating the pillars and trophies. This crop was a very paying one during the American Civil War, in 1870, and subsequently, when a cotton spinning mill was established at Ipswich. After a long lull, the Department of Agriculture elaborated a scheme which, it was hoped, would revive the industry, and also set up a cotton ginnery in



PLATE 23.—COTTON EXHIBIT.

Brisbane for the purpose of ginning all cotton consigned to the Department, which undertook to take, gin, and market all cotton sent to the departmental gin, making the growers an advance of 2d. per lb., supplying all seed gratis, and finally dividing all profits made by sale of the ginned cotton amongst the suppliers. Many farmers took advantage of this, and are so satisfied with the returns that far larger areas will be placed under cotton this spring.

HORTICULTURE.

The horticultural display at the Exhibition was well worthy of a visit; the excellent grouping and tasteful arrangement of the various beautifully variegated and scented flowers made an admirable and pleasing effect, interspersed with splendid ferns and other foliage plants. Mr. Bartels, as usual, had a beautiful exhibit of orchids, in the cultivation of which he is a pastmaster, and was the chief exhibitor, Mr. Jarrott being the only other exhibitor of these beautiful and, in many cases, enormously valuable plants. Mr. W. T. Bick's collection of palms was very striking. As for sweet peas, the exhibits all round were conspicuous for their size of bloom and beauty of colour. Messrs. Allan, Brewster, Barber, Phillips, and others exhibited magnificent blooms. Mr. Phillips took nine first prizes for his exhibit. Carnations, roses, and pansies were much in evidence, and gave evidence that flower-gardening has become a favourite hobby, if we may so call this delightful occupation, amongst a large number of city and suburban residents.

RECORD ATTENDANCE AT THE EXHIBITION.

On the fifth day of the Show, as a result of the unfavourable weather, the attendance and gate receipts showed a drop as compared with the corresponding day of last year, the takings being £935, as compared with £1,183 on the fifth day of the 1917 Show, a falling off of £248. The total for the five days this year was £7,005 as against £6,435 for the first five days of last year. The adult attendance on that day was estimated at about 15,000, and there were probably not less than 20,000 on the grounds during the day, or an approximate attendance of about 155,000 people for the five days of this year.

SALT FOR PIGS.

Last July, Mr. Thurlow, Inspector of Slaughter-houses, visited a piggery in the Enoggera district, and found that the pigs were suffering from some ailment. On inquiry and investigation he found that the owner had become possessed of a lot of damaged salt salmon which he intended and had used for feeding his pigs. It was at once seen that this salt food was the cause of the whole trouble, and, as salt is most dangerous to pigs, Mr. Thurlow strongly recommended the disuse of the salmon. Six of these pigs had died, and but for his fortunate visit, the owner would probably have lost the whole of his herd, amounting to some 300. Another pig-raiser in the district was about to purchase some of the damaged salmon, but fortunately heard in time of the above occurrence; hence, he did not buy and thus escaped a possibly severe loss.

CLOVER EIGHT FEET HIGH.

A unique crop of clover has been grown by Mr. A. Sommerlad, of Tenterfield, the results of which have justified the grower in his fifteen years of testing this variety. The clover, which is known as sweet or Bokhara clover (*Melilotus alba*), reached an average height of 8 ft., some portions of the crop being feet higher—a magic growth for clover. Mr. Sommerlad has about 50 acres of it in his cultivation paddocks, and cattle have grazed on it with the best results. It is quite safe to feed to dairy cattle, as they do not become blown on it. He has allowed about 10 acres to go to seed, which has been harvested for seed. It is a biennial plant, but if allowed to seed at the end of the second year it becomes permanent.—Exchange.

THE GROWING OF LUCERNE.

[CONTINUED FROM AUGUST JOURNAL.]

BROADCASTING LUCERNE.

The usual practice is to broadcast lucerne seed; and for the purpose the small hand broadcasting machines are to be recommended. In order to secure regularity of seeding, it is, of course, necessary to select a tolerably calm day for the purpose; moreover, the seed should be divided up into two even lots, each of which should be sown over the whole surface, but at right angles to the other. The seed should be broadcasted over a lightly-rolled surface, and subsequently rolled in, preferably with a ribbed roller. It is important to remember that lucerne seed should never be buried deeply; hence, if a harrow is used for covering purposes, only the very lightest of harrows should be resorted to. In my experience, a ribbed roller is infinitely superior for the purpose to any harrow.

QUANTITY OF SEED TO BE SOWN TO THE ACRE.

Opinions differ as to the quantity of lucerne seed that should be sown to the acre; some apparently favour light seeding, others heavy seeding. Personally, I am from conviction an advocate of relatively heavy seeding, chiefly because I am satisfied that heavy yields are very largely dependent on a dense stand of plants from the very outset. Hence, when broadcasting lucerne, I recommend a seeding of 20 lb. to the acre, 10 lb. sown in one direction, followed by 10 lb. sown at right angles to the first direction. This seeding will appear heavy to many. It should be recollected, however, that the best of lucerne-seed has not a value of much above 88 per cent., if we take into consideration impurities and defective grain. Moreover, when seed is broadcasted, a certain proportion is always lost from the depredations of insects, birds, &c. Briefly, so far as I am concerned, I have never found 20 lb. of seed to the acre too much. I must add, however, that many lucerne-growers recommend 12 lb. of seed to the acre as sufficient for all purposes.

DRILLING LUCERNE.

Broadcasting is not the only method of sowing lucerne in use; at times it is drilled. Drilling lucerne presents special advantages when the crop is not irrigated. The plants are then set out in rows sufficiently far apart to admit of regular summer tillage between cuts. The usual distance is 18 in. to 24 in. Naturally, drilling involves the use of far less seed than broadcasting; I believe that 8 lb. to 10 lb. of good seed to the acre should be amply sufficient.

When drilling lucerne-seed, special precautions should always be taken not to bury the seed too deeply; and with this object in view it is always advisable to drill over a rolled surface. The seed itself should be sown in mixture with bonedust at the rate of 1 cwt. to the acre.

GOOD SEED CHARACTERISTICS.

Lucerne-seed is at all times more or less costly; hence it behoves us to see that we are supplied with the best kind of seed procurable. Prior to the war, several types of lucerne-seed were usually on the market, among others Hunter River seed from New South Wales; Province seed, usually imported from France; various types of American seed; and, finally, seed of South Australian origin.

Of these different types, Hunter River seed was usually the most popular. Conditionally on the seed chosen being fresh, well-developed, and tolerably free from impurities, personally I do not think that there was ever much to choose between the different types. I must add, however, that in my own experience some seed of American origin appeared to give the best results from the point of view of total yields, at the Roseworthy Agricultural College. Unfortunately, when I approached the seedsmen who had supplied this seed with a repeat order they were unable to meet it.

At the present time we are thrown back on local supplies; and, so far as I know, providing the seed complies with the usual standards of quality I do not think that we have much to complain of. Good lucerne-seed should be haricot-bean-shaped, bright-yellow in colour, plump, and well developed. A small proportion of impurities is unavoidable in the best of samples; it should not, however, exceed 2 per cent. to 3 per cent. The seed should always be guaranteed free from dodder.

On a germination test, it is generally probable that not more than 90 per cent. of the lucerne-seed will germinate; and, allowing for impurities, this will give to ordinary good seed a cultural value of 87 per cent. to 88 per cent. Preference is sometimes expressed for two-year-old seed, on the ground that it germinates more regularly. Personally, however, whenever obtainable, I prefer seed of the preceding season.

FIRST-YEAR TREATMENT OF LUCERNE-FIELD.

If lucerne has been broadcasted in autumn, there is nothing that can be done to the field until the first growth is ready for cutting. If, on the other hand, the lucerne has been drilled in, it can, and should be, horse-hoed as soon as the rows of lucerne are sufficiently distinct for the purpose.

As has already been stated, in spite of careful fallowing, and all the more if fallowing has been neglected or omitted, weeds will spring up very freely in a recently-sown lucerne-field; and during the winter months these weeds will make stronger growth than the lucerne. I have known fields in which, by August, the lucerne, although well germinated, was barely visible. This condition of affairs is apt to frighten those who sow lucerne in autumn for the first time; I know of one grower to whom I had recommended the practice who proceeded to plough up the field rather than endeavour to control the weeds on the lines I shall indicate.

In spite of weeds, if in the early autumn the lucerne had germinated regularly, it will in the spring still be found there beneath the shelter of the weeds, and all that we need to do is to proceed to get rid of the weeds by using the mower freely and repeatedly. The first cut given in August will prove a very effective check to them; a second cut given in September will give the lucerne the start which it requires, and will enable it to smother out completely the weeds as the temperatures rise. It may be taken for granted that the third cut will be pure lucerne, without any weed admixture. Moreover, no summer weed has any chance of growth in a recently established lucerne-field.

If a recently sown lucerne-field is carefully handled and irrigated, five to seven cuts, including the two initial weedy ones, may be taken in the course of the first season; and each cut, if dried, will average within the neighbourhood of 1 ton to the acre. I must insist very strongly that whatever may be the practice adopted later on, on no account should a lucerne-field be grazed, however lightly, in the first winter of its development. This injunction applies not only to sheep, which are particularly dangerous, but also to larger forms of live-stock.

GENERAL TREATMENT OF LUCERNE-FIELD.

When the field enters upon the second year of its growth, the general treatment becomes normal. By this time the roots of the plant have become thoroughly well established, and the plants generally may be looked upon as being at the maximum of their productiveness. Among general cultural operations essential to success in lucerne-growing, we may dwell upon the following:—

SPRING DRESSING OF MANURE.

We must recollect, particularly when irrigation is practised, that the drain on the land by a lucerne crop is very considerable; hence, if we look to the continuance of high yields from year to year, we must be prepared to dress the field regularly in the opening spring months.

Lucerne, like most leguminous plants, benefits chiefly by dressings, both of phosphates and potash salts. Potash, however, is a very costly manure, nor, indeed, is it obtainable at the present time. On the other hand, in the great majority of our northern soils, at all events, potash appears to be very abundantly present; the only difficulty is that it is not always readily available to the roots of plants; for this purpose it has, as a rule, to be transformed into sulphate. This result can be secured; very readily and cheaply, by a suitable dressing of gypsum. Gypsum has the effect of mobilising the potash salts, and of enabling them to circulate freely and reach the deep roots of lucerne plants. Hence, in the spring months of the year, I recommend a dressing of 3 cwt. to 4 cwt. of gypsum to the acre, and about 2 cwt. of superphosphate.

Subsequently to this dressing the lucerne-field can, with great advantage, be run over with a spring-tine cultivator, in order to break through the surface crust and open up the soil. Little or no damage will be done to lucerne plants. The use of farmyard manure is sometimes recommended as a suitable top dressing for lucerne. Personally, I do not agree with this practice, providing always that a sufficient dressing of farmyard manure had been given prior to seeding.

GROWTH AND YIELDS OF LUCERNE.

The growth and yield of lucerne vary much with circumstances, the chief of which are probably temperature and an adequate water supply. Taking the latter for granted, the greater the heat the more rapid the growth of lucerne and the heavier its total yearly yield. Between August and April, under exceptionally favourable conditions of soil, temperature, and water, as much as 10 to 11 cuts of

lucerne have been secured, at intervals of three to four weeks' time. Under average conditions, however, five to six cuts, at intervals of five to seven weeks, are more usual.

Green lucerne loses about 75 per cent. of its weight on drying; and we may reckon that each well-grown cut of lucerne will correspond to about 1 ton of hay. As a rule, irrigation waters should be applied immediately after a cut; but in many circumstances, a second watering given between two cuts will lead to appreciably higher results. Needless to add that irrigation water must be tolerably free from saline matter; probably not more than 100 grains of total salt to the gallon is safe, even in very well-drained land.

When lucerne is subject to irrigation, total yields are, of course, very much lighter, and depend, even when the water table is within easy reach, almost exclusively on summer rainfall. Personally, I am of the opinion that unirrigated lucerne should always be drilled in rows, and tilled regularly after each cut. In these circumstances three to four cuts in one season may often be secured.

BEST TIME TO CUT LUCERNE.

The usual recommendation is that lucerne should be cut when about one-half of the field is in bloom. It is, perhaps, true that at this stage lucerne is better relished by livestock as yet unaccustomed to it. It is highly questionable, however, whether at this stage, lucerne has the best possible feeding value; in my opinion it is apt to be too hard and fibrous. Personally, I prefer cutting the crop just as the first flowers begin to appear.

Lucerne, as is well known, may be fed in the green state, which, perhaps, is the most economical way of handling it. It involves, however, bringing out every morning the mower for the day's requirements. Livestock new to lucerne do not always take to it readily at first in the green state, and it is generally advantageous to allow it to wilt slightly before offering it to them.

If all lucerne available cannot conveniently be handled in the green state, it can be converted into hay. Or, again, this practice may be adopted as a general rule. The making of hay offers no particular difficulties; in the warmer months of the year it is fit to be shifted in a couple of days. The chief difficulty to be avoided is a tendency to brittleness in the hay, and, as a result, a loss of leaf when carelessly handled; hence, when the weather is warm, it is usually safer to handle lucerne hay in the cooler hours of the morning.

GRAZING LUCERNE.

There is not the slightest doubt that if we have in view the highest possible total yields and length of life, that it is inadvisable to graze a lucerne-field at any time; in other words, grazing both reduces the apparent productiveness of a lucerne-field and its life. Nevertheless, we are bound to admit that grazing lucerne during the winter months of the year frequently offers high economic advantages, which, it may be, make ample compensation for its disadvantages. I, for one, confess that whenever possible during the winter months, I have always turned a lambing flock into a lucerne-field more than twelve months old; and it is a practice which I recommend to others. It goes without saying that when this practice is followed the field calls for careful watching; at no time should it be allowed to get too bare, and whenever the surface becomes too wet the flock should be temporarily removed.

HOW LONG SHOULD A LUCERNE-FIELD HOLD OUT?

There are some who appear to entertain the belief that a lucerne-field, once sown, should continue productive almost indefinitely, and who attribute to carelessness or neglect any tendency to falling away on the part of the field. Undoubtedly care and attention will, within certain limits, lengthen the period of profitable productiveness of a lucerne-field; nevertheless, Nature has set certain limits beyond which we cannot go. It is true, perhaps, that individual lucerne plants appear to persist for an almost indefinite number of years, but it would be rash to assume that the sum-total of individual plants which constitute the lucerne-field will be able to do the same. As a matter of fact, if the field is to be reasonably productive, individual plants are far too crowded to be able to occupy the same land for any length of time; from year to year individual plants will gradually die out throughout the field, which becomes correspondingly thinner and thinner, with corresponding yields lighter and lighter, until, if we take the cost of irrigation into consideration, the field no longer pays for handling. Eventually, as is often the case in the opening stages of growth, the sparsely clad field may carry more weed growth than lucerne.

The average lucerne-field may be taken to be at its best in the second year of growth; and thereafter it slowly declines. There are some fields, particularly if over-grazed, that are not worth irrigating after their fifth year; and there are very few

that are worth irrigating after their tenth year. Hence, when laying out land for irrigation purposes, it is as well to have within reach a sufficient area to bring in alternate periods, under lucerne at one time and under some other type of crop at another time. When the lucerne-field is played out, or when it no longer pays to waste water on it, it should be ploughed up and either grazed or brought under some other type of crop for a number of years. In the meantime, a new area of land could be placed under lucerne.

It is very unwise to sow lucerne a second time on old lucerne land at too short an interval between two crops. No less than four to five years should intervene between two lucerne crops. In the intervening years irrigated crops, such as maize or sorghum, can be grown, or ordinary winter crops, such as any one of the cereals.

LUCERNE AS A PURELY GRAZING CROP IN RELATIVELY DRY AREAS.

Hitherto I have dealt with what might be called the orthodox methods of handling lucerne; but, as farmers, even in relatively dry districts, we can often put it to other important uses. We can, with great advantage to ourselves, treat it as a purely grazing crop. In this connection, I shall describe a practice which I successfully followed for several years at Roseworthy.

Every season I used to sow about 20 acres of lucerne in an ordinary cereal hay crop. The hay crop was first drilled in, in the ordinary way; we then broadcasted lucerne over the selected area at the rate of 6 lb. to 8 lb. to the acre, and the seed was subsequently lightly rolled in. When sown in this fashion, the lucerne plants grow up in the shelter of the hay crop, and make a very fair showing by hay harvest time. Occasional failures are, it is true, unavoidable; but, if due care be taken, general conclusion is, that lucerne should not be grazed too soon after the removal of the hay crop; time should be given to it to harden and to get a firm hold of the ground. Generally speaking, the first grazing should not take place before April. In the years that follow, the lucerne can, of course, be grazed whenever it is found convenient to do so. In this connection, grazing lucerne laid down in this way will be found exceptionally useful in relatively wet summers, in which the dry feed is more or less spoilt. Naturally, in summers such as these, the growth of the lucerne is above the average. Personally, I generally endeavoured to reserve these lucerne-fields for the autumn grazing of lambing flocks.

The constant grazing to which these fields are subject, tends to shorten considerably the life of the plants. Generally speaking, grazing lucerne-fields should be broken up and brought back into the ordinary cropping rotation in their third or fourth year; hence, if you make it a practice to put down 20 acres under lucerne every year, you will usually have from 60 acres to 80 acres of lucerne at your disposal for grazing purposes, and this will represent an exceedingly valuable farming asset in any district.

FLAX AND LINSEED.

For many years unsuccessful attempts were made to establish the flax-growing industry in Victoria. It had been boomed and bonused, and experimented with, only to prove time and again that, on old-world lines of practice, which involved costly and laborious methods, it was unsuited to our Australian conditions of agriculture, and had to give place to more remunerative crops, just as happened to the cotton-growing industry in Queensland in the seventies, at the close of the Franco-Prussian war. But in both cases, time and the perseverance of certain believers in the ultimate successful establishment of these industries overcame all difficulties. It had always been held and practised, and adopted in the early experiments in Victoria, that a crop of good fibre and seed could not be obtained from the same field; that, in order to get good fibre, the crop had to be harvested when in blossom, before the seed had ripened, and, above all, that it had to be hand-pulled—a very costly and laborious process. Eventually, however, three young settlers, the Wollf Brothers, of Traralgon, proved that both seed and fibre can be obtained from the same crop, after the seed had thoroughly ripened, and that so unnecessary is hand-pulling, that fibre which will command the top price when submitted to expert dealers in flax and other fibres is produced when the reaper and binder is turned into the flax fields, cutting down the crop at the rate of 10 or 12 acres a day. The old process of pit-retting (that is, steeping the straw for several weeks in pits of water) has been discarded, and the much more simple one substituted of spreading it out on the grass in the autumn, to let the dew and rain do the work, and instead of rippling out the seed, two wooden rollers are employed, one above the other, and between these two men can feed the sheaf-heads without untying the binder knot, and thresh out the seed perfectly, at the rate of over two acres a day.

RETURNS PER ACRE.

So far back as 1903, the pioneers of the industry, Messrs. Wolff Bros., had 120 acres under flax. Their gross returns from this area in seed and fibre amounted to £2,000, or at the rate of £16 16s. per acre. After paying away in rent, cost of cultivation, and all the processes of harvesting, threshing, and fibre manufacture, over £8 per acre, they realised the handsome net profit of £8 10s. per acre. Samples of the dew-retted flax were sent to some of the largest flax buyers in Europe, and an offer was received from a Belgian firm of £45 per ton, delivered in Melbourne. The prices obtained from local Melbourne buyers ranged from £40 to £45 per ton.

The average return of seed was 14 bushels per acre, which sold readily in pre-war days at £14 per ton, for linseed oil making, working out at 7s. 6d. per bushel, which, together with the flax, gives a gross return of £16 16s. per acre, the net return being £8 10s. per acre.

TIME TO SOW.

Spring sowing, as in Europe, is found to be a mistake in Australia. The time to sow here is in May. If sown broadcast the quantity of seed required per acre is 1½ bushels. Of two varieties, the White Belgian and the Riga, the latter is to be preferred. It gives a greater quantity of fibre and seed per acre, and if got in early there is no fear of any worm attacking the seed pods.

METHODS OF CUTTING AND THRESHING.

In cutting with the binder, the knives must be kept sharp—sharp as razors. This enables the work to be done at the rate of 10 or 12 acres per day, the sheaves being beautifully even, and not at all tangled. There is much less loss of seed by shaking out than is the case with many other cereal crops. After standing in the stooks in the paddock for about a fortnight it can be either threshed, and the straw stacked, or stacked as it is, and threshed at leisure. A primitive and cheap method of speedy threshing without injury to the seed may be thus described:—

Two wooden rollers, each two feet in diameter, set one above the other, on spindles. The spindle of the upper one works in slot-holes with a perpendicular play of about two inches, and to the spindle of the lower one is attached a wooden pulley, on which is placed a belt from a five-horse-power oil engine which drives the “breaker,” and the “scutcher.” It is driven at the rate of 140 revolutions per minute. One man feeds in the sheaves without untying them, and another man or boy takes them away. The seed, being all threshed out, is then cleaned ready for market by being put through an ordinary grain winnowing machine. Two men, with this machine, can thresh out the crop at the rate of from two to three acres per day. Previous to the war, 6d. per bushel was paid for threshing (by contract), and 2d. per bushel for cleaning. One bushel weighs 56 lb. Rates of wages since the war are higher, but so also is the price of flax and linseed.

MANUFACTURING THE FIBRE.

The method of preparing the fibre is equally simple. The crop remains in the stack till March. It is then carted out and spread on the grass land. One acre of grass land provides room for two acres of the crop. The bundles, after the seed has been removed, are untied, and spread out evenly in a thin layer on the ground, and if there have been good rains or heavy dew, the straw is ready for turning in about a fortnight. The turning over is quickly done with a long pole.

After turning, the straw is left out for another fortnight or three weeks. Then it is gathered up loose in thin round stooks to dry for two or three days; then tied into handy bundles, carted and re-stacked close to the shed where the flax is manufactured. All this latter work must be done in dry weather.

THE COST OF THE MACHINERY

is not heavy even in these war times. The “breaker” costs about £35, the “scutcher” £40, and both are driven by the same oil-engine.

It should have been stated that the breaker (£35) consists of four fluted iron rollers in two sets, which turn half round and back. The straw is passed between the two sets, which break out the woody material in the stems and leave the fibre with a lot of woody particles adhering to it. Then the scutcher, which is simply a set of wooden blades revolving rapidly behind an iron shield, cleans them off and leaves the fibre fit for market. The fibre, when quite dry, is put up in 14-lb. bundles and then packed in wool bales holding about 5 cwt.

UNLIMITED MARKETS.

The value of imports of linseed into Great Britain amounts to between £4,000,000 and £5,000,000 annually; linseed cake for cattle-feeding to £1,500,000;

and flax to over £2,500,000. In 1913-14, just before the war, the gross linseed imports into the United Kingdom for the twelve months were 3,274,000 quarters, and the total American imports of linseed for 1914, 1915, and 1916 respectively, were 231,163 tons, 370,909 tons, and 327,451 tons. A market is also assured in New South Wales, one firm in the linseed oil trade (Messrs. Meggitt, Ltd., Sydney) guarantee a market for at least 10,000 tons annually, at prices ranging from 6s. to 10s. per bushel in the near future. As shown above, an average net profit per acre, based on a yield of 14 bushels per acre, should amount to £8 10s.. To this must be added the value of the flax, which in the British markets is to-day worth over double the pre-war prices. The price of linseed in the London commercial reports is quoted as from £28 to £30 per ton, or up to 14s. per bushel. Mr. D. MacPherson, when manager of Biggenden State Farm, 50 miles from Maryborough, wrote as follows on experiments made at the farm in 1910 in flax-growing:—

“Recent developments in the methods of harvesting and treating the fibre and seed of the flax plant make it probable that this crop will be found to be a distinctly paying one for Queensland. As the seed may be drilled or broadcasted, and the crop cut with a binder, it follows that these operations need not run into greater expense than they do for wheat, while the cash returns should be greater, as both seed and straw are of value.

“In the ‘Victorian Agricultural Journal,’ May, 1906, the price of flax seed or linseed is given as 8s. per bushel, and the same journal estimates the value of the fibre from 1 acre at £11 5s., and the cost of dew retting at 15s. per acre, and manufacturing £3 10s. Dew retting is, however, not always practicable here, as in some seasons there is practically no dew.* This trouble is, however, likely to be soon overcome; and, if not already so, it soon will be possible to market the flax straw unretted.

“From experiments carried out at this farm during the past three years, I am convinced that anyone having the necessary implements for handling wheat could also grow flax; and, so long as the market value of linseed did not go below that of wheat, would receive a better return per acre, even if the seed only were marketed, owing to the more certain yield from the flax.

“Then, if we take into consideration the value of the fibre, and this is really the main product of the plant, and estimated in the Victorian Journal to be worth over £11 per acre, it must be admitted that there is every probability of the crop being a paying one. Another consideration, and one that should have considerable weight with us, is that the crop is less dependent on climatic conditions than any of the cereals.

“Should the season be a wet one, it is probable that the crop of seed will ripen unevenly, and in this way a proportion of seed may be lost; but, even so, the yield of seed will still be a creditable one, and the crop of fibre will be extra heavy.

“If, on the other hand, it strikes dry weather, neither the seed nor the fibre will be any the worse for eight or ten weeks of comparative dry weather before cutting.

“Again, flax likes a warm free soil, and, as the soil on this farm is very stiff and heavy, it is more than likely that the results obtained here may be improved upon.

“I give the results from an experimental plot planted here on the 3rd April, and cut on the 30th September. Also, the rainfall for the months between planting and harvesting. It may be mentioned that the seed did not germinate till after the rains that fell in the last week of May, so that the crop takes only four months from germination to harvest.

“The plot sown contained 3 perches. A portion of this was cut before the seed was properly ripe for fibre samples, &c.

“From the remainder (exactly 64 sq. yds.), 22 lb. of clean plump seed and 47 lb. of threshed straw was obtained, or at the rate of 27 bushels (60 lb. per bushel) of seed, and 31 cwt. 3 qr. of straw, to the acre.

“I have, so far, been unable to get the fibre content of the straw.

“Rainfall—April, .34; May, 4.02; June, 5.24; July, 1.55; August, .96; September, .27.

“I have grown flax here for the three past seasons, and the crop has every time given satisfactory results.

“The last two seasons the large-seeded Russian variety was grown, and the season before that the Riga.”

*In Germany and Switzerland, we have seen the flax spread out on the grass, and watered from watering-cans. Dew is not an absolute necessary for dew-retting.—Ed., “Q.A.J.”

MARKET GARDENING.

EXPERIMENTS IN CONNECTION WITH THE DESTRUCTION OF INSECT PESTS OF THE TOMATO.

In May, 1917, the Director of Fruit Culture, Mr. A. H. Benson, with the view of assisting tomato-growers to prevent the serious losses of these crops due to the ravages of the tomato moth, by destroying the larvæ, made arrangements for a series of experiments to test the efficacy of certain sprays and various forms of lantern traps at Wynnum. The results were published in the February (1918) issue of the Journal, since when numerous inquiries are frequently being received (presumably from non-subscribers to the Journal) by the department, respecting the best method of preventing the ravages of tomato moths. It is, therefore, thought advisable to reprint, with useful additions, the article of February last, as follows:—

The experiments were carried out on two plots, one owned by Mr. H. Randall, Wynnum West, and the other by Messrs. Hargreaves and Sons, Manly. They were initiated to ascertain the most effective means of combating the grubs or larvæ which destroy a large proportion of the tomato crop almost every year.

There were two main objectives—

1. To find the most effective means of destroying the eggs and larvæ on the plants;
2. To find the best means of trapping the moths.

The following insecticides were used:—*Arsenate of Lead* (Sherwin-Williams Brand).—This was mixed with water at the rate of $\frac{1}{2}$ lb. to 16 gallons (about four kerosene tins). The $\frac{1}{2}$ lb. arsenate was first made into a thin cream by adding a little water gradually and afterwards adding the remainder of the water. This quantity, 16 gallons, could be applied by an autospray pump, worked by one man, in about $2\frac{1}{2}$ hours, and was found sufficient to treat one-quarter of an acre of tomato plants. Between 3.30 p.m. and dusk was found the best time of the day for spraying. The mixture must be kept in motion whilst being applied.

Paris Green and Lime.—One pound Paris green to 6 lb. finely sifted slacked lime. This was well mixed, and it was found that it should be applied on a calm day by means of a sulphuring machine or by tying the mixture in a small bag or piece of bagging and shaking or beating it over the plants. This quantity was found sufficient for one-quarter acre; the quantity to be applied would depend largely on the size of the plants and the calmness of the weather.

Two applications of each of the insecticides were made—first, when the first lot of flowers had withered, and the second about four weeks later; but it was found that three, or even four, applications would be beneficial at intervals of about three weeks.

The arsenate of lead showed slightly better results than the Paris green and lime.

Various lights were tried for trapping moths at night as follows:—

1. Bicycle carbide lamp with trays specially arranged. This proved unsatisfactory, and was abandoned early in the experiments.

2. Ordinary naked carbide lamps with kerosened trays underneath.
3. Ordinary hurricane lamps (kerosene), also with kerosened trays underneath.

The common hurricane lantern was found the most satisfactory light for the purpose. Details as to construction of trays and setting up lanterns are given and illustrated in the February issue of the Journal, page 67. The lantern was so arranged that the moths would rebound from the glass globe into the kerosene-covered water in the tray. About half an inch depth of water under a thin layer or film of kerosene was found sufficient for destroying the moths in the tray.

STAGING VEGETABLES FOR SHOW.

Somewhere about the year 1910 (says "South African Gardening," June, 1918), vegetable growing and showing had been raised to such a pitch of excellence in the British Isles, that a vegetable society was formed which holds its show every year in London. This is held in the autumn (corresponding to our spring in Queensland—Ed.). There are classes for 12, 9, or 6 kinds selected from a given list. Classes for a definite number of salads, 9-6, or any the committee select. Potatoes, onions, and many other vegetables are also shown in separate classes.

Presuming an intending exhibitor is going to put up a collection of, say, nine distinct kinds, he may perhaps select cauliflower, pea, onion, parsnip, carrot, turnip, celery, beet, cress.

The Cauliflowers, three or six (the schedule generally says how many of each may be shown), are chosen for their whiteness, closeness of curd, freedom from blemish of any kind, and uniformity of size. The leaves are carefully trimmed away, exposing the curd. They are generally arranged in a pyramid in the centre or at the back; perhaps two pyramids can be made. They must all be the same variety. Cut cauliflowers in the early morning.

Pea.—Large, fully formed pods, free from blemish. These must be cut from the plant and held by their stalks in order not to damage the bloom on them. They should not be washed therefore. These are sometimes laid out in straight rows or forming a pattern round some other exhibit. In some cases they are piled neatly on a bed of parsley or in a chip basket, or fastened thickly to a cone of wire completely covering it. Some people grow the plants in tins, and bring the whole thing, training the peas up the back of the stage, while others arrange them on black velvet pads.

Onion.—Large, solid, good shape. Carefully washed with a soft sponge. The dry top is cut and doubled down and fastened neatly at the neck. The roots are trimmed off close unless "spring onions" are shown, when the long white roots are left, instead of fully matured ones. They must be the same variety, size, and shape. Sometimes arranged in a pile, in a dish or basket, in straight lines or triangles or bedding in parsley to show up the colour.

Parsnip.—Long, straight, perfectly shaped roots. Same in size and height and thickness. Some are shown three or four feet long, but

shorter roots are quite as effective and more useful. Dig without damaging or breaking the roots, wash with a soft sponge. Trim off the tops to within a couple of inches of the crown. Staged in pairs or triplets in baskets or on the table; sometimes stacked like corn-sheaves in a stook.

Carrot.—The same points must be observed in showing these. Undamaged, straight, even roots, graded to size, carefully washed—not scrubbed. Staged in baskets in rows or piles, the number shown according to schedule as in all cases. Stump-rooted must not be shown in the same pile as long ones. Two varieties cannot be shown unless it is so stated.

Turnip is effective as a show vegetable, showing up well against the orange colour of the carrot and the green of the pea pod. The root is washed and the tops trimmed away, but the root is left intact. Pile them with the root outwards, all the tops being hidden.

Celery.—A limited number of sticks of even size perfectly blanched. These want careful washing to get all the soil from between the stalks. The root is trimmed off, leaving a short point as in a pencil. Some people leave the green top intact; others trim it away down to the blanched portion.

Beet.—Long-rooted beet should be straight, thick, unbranched, and a good deep colour. Trim away the little fine roots and the tops, leaving the tiny centre leaves if you choose. Flat or round beet must not have the root removed, but, like the long beet, must be carefully washed. Often piled as for turnips in the case of the round beet or arranged in rows for the long ones, which, of course, must be all the same in length and thickness and colour.

Cress.—Often shown with mustard, but is shown separately too. Can be grown in the round or square chip basket, in which it is shown. If not it is cut and placed in the basket as though it were growing. It is very pretty grown on a cone of clay covered with fine wire. The seed is thrown on the wet shape, and if successfully done makes a perfect mass of fresh young green.

Potatoes.—Dig very carefully so as not to injure the tubers. Use a soft sponge and be careful not to break the skin. Tubers must be free from blemish; size, shape, and colour, not necessarily the biggest, which are often lacking in flavour. The bench itself should be covered, for choice, with a white covering, as it shows up the groups well. Parsley garnishing helps to set them off sometimes. Do not overcrowd—leave some space between so that each exhibit can be shown to its best advantage. Very often a few foliage plants are allowed, but on the whole they are better away unless used with great care and judgment. Group the colours harmoniously, and keep the whole evenly balanced.

Aim for one central feature, and work up to that. Perhaps the best specimen is onion; then give that prominence. In the photograph in the May number of the exhibit from Potchefstroom the pile of Keiffer pears quite dwarfed the apples, and even the pumpkin looked insignificant. Aim for quality, not for huge ungainly roots. I have not said half what I would wish on behalf of the vegetables and their place on the show bench, but Mr. Editor's blue pencil is large and thick. Perhaps at some future date he will give me an opportunity to plead for some other kinds of less known vegetables.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Book Societies is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.

DAIRY BREEDS—*continued.*

GUERNSEYS.

Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia
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HOLSTEINS.

Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman ..	"St. Athan," Wyreema	12	47	Do.
F. G. C. Gratton ..	"Fowlerton," Kingsthorpe	1	15	Do.
R. S. Alexander ..	Glenlmond Farm, Coolumboola	1	3	Do.
Ditto	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings ..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff ..	Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.
E. Swayne	West Plane Creek, Mackay	1	2	Do.

ILLAWARRA.

A. Pickels	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	Ramsay	2	22	Do.
Hunt Bros.	Springdale, Maleny..	3	62	Do.

MILKING SHORTHORNS.

P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	Torran's Vale, Lane-field	1	9	Do.
W. Middleton ..	Devon Court, Crow's Nest	3	27	Do.
A. K. Yorksten ..	"Dunure," Miles ..	2	8	Do.

BEEF BREEDS.

SHORTHORNS.

T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan ..	"Arubial," Condamine	3	6	Do.
W. B. Slade	E. Glengallan, Warwick	2	20	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS— <i>continued.</i>				
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FROM 30TH JUNE TO 31ST JULY, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%.	Lb.	
Buttercup ...	Shorthorn ..	30 May, 1918	934	4·5	46·93	
Lady Melba ...	Holstein ...	31 Mar. „	912	4·5	46·12	
Lady Loch II. ...	Ayrshire ...	13 June „	828	4·7	43·82	
Miss Betty ...	Jersey ...	9 June „	752	4·6	38·90	
Magnet's Leda ...	„ ...	20 June „	724	4·4	34·91	
Constancy ..	Ayrshire ...	7 April „	683	4·5	34·54	
Yarraview Ida's Hope	Guernsey ...	5 May „	514	5·7	33·63	
Royal Mistress ...	Ayrshire ...	13 Mar. „	514	5·2	31·55	
Charming Damsel	„ ...	1 May „	660	4·1	30·27	
Lady Peggy ...	„ ...	30 Mar. „	598	4·3	28·83	
Snowflake ...	Shorthorn...	28 June „	608	4·2	28·60	
Rosalie II. ...	Ayrshire ...	2 July „	615	3·5	23·86	
Dawn of Warragaburra	Jersey ...	4 May „	556	3·7	22·87	
Lady Spec...	Ayrshire ...	19 Feb. „	446	4·5	22·45	
Leda's Jessie ...	Jersey ...	25 Mar. „	313	5·8	21·70	
Sylvia II. ...	Shorthorn...	14 July „	431	4·3	20·77	

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JULY, 1918.

Westerly winds and cold nights were again in evidence during the month, and the effect they have had on the light breeds is very noticeable. Some pens dropped 50 per cent. at the commencement of the month, but pulled up during the last week. These adverse weather conditions in no way hampered the laying in the heavy section, and some splendid scores were registered. The previous world's record for winter laying, held by a pen of six Black Orpingtons, has been passed by a pen of six White Leghorns owned by the Dixie Egg Plant. Their score for the four months was 579, the previous records being 570. A Black Orpington in Mr. A. E. Walters's single test pen laid three eggs in twenty-four hours. Two of the eggs had rough shells with no glazing, and one was without a shell. Only one case of such laying has come under our notice before. The last week of the month has shown a decided improvement in the number of eggs laid in almost every pen of the competition. W. Wilson and H. Fraser have each had a bird in for medical treatment, but both are now back in their pens. The following are the individual records:—

Competitors.	Breed.	July.	Total.
LIGHT BREEDS.			
*Dixie Egg Plant	White Leghorns ...	143	579
*G. W. Hindes	Do.	136	496
*E. Chester	Do.	130	486
*G. Howard	Do.	132	477
*C. Knoblauch	Do.	127	476
*C. P. Buchanan	Do.	126	474
*T. Fanning	Do.	126	465
*Geo. Prince	Do.	118	461
*Mrs. L. Henderson	Do.	127	458
*W. Becker	Do.	116	447
*G. H. Turner	Do.	123	443
*W. Lyell	Do.	120	432
*R. Holmes	Do.	136	430
*O.K. Poultry Yards	Do.	103	427
*L. G. Innes	Do.	120	411
*Oakland Poultry Farm	Do.	95	409
*E. A. Smith	Do.	128	407
B. Caswell	Do.	93	407
Harold Fraser	Do.	88	395
Dr. Jennings	Do.	91	389
*Range Poultry Farm	Do.	105	386
*Thos. Taylor	Do.	108	381
O. W. J. Whitman	Do.	102	381
J. J. Davies	Do.	102	381
*C. Porter	Do.	112	372
*Quinn's Post Poultry Farm	Do.	105	261
*J. Zahl	Do.	95	353
R. T. G. Carey	Do.	104	352

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	July.	Total.
LIGHT BREEDS— <i>continued.</i>			
G. Williams	White Leghorns ...	70	346
*Mrs. Coomber	Do.	109	343
S. Wilkinson	Do.	96	317
*J. M. Manson	Do.	113	310
*Homalayan Poultry Farm	Do.	97	306
*T. B. Hawkins	Do.	81	285
Mrs. L. F. Anderson	Do.	74	285
Geo. Trapp	Do.	69	272
Mrs. A. G. Kurth	Do.	67	266
H. F. Britten	Do.	78	264
H. B. Stephens	Do.	75	264
*J. W. Newton	Do.	68	261
Progressive Poultry Pens	Do.	65	259
Shaw and Stevenson	Black Leghorns ...	91	259
*Mrs. R. Hunter	White Leghorns ...	79	256
B. Chester	Do.	99	217
P. O. Oldham	Do.	66	204
W. A. Wilson	Do.	71	199
A. W. Walker	Do.	39	160
HEAVY BREEDS.			
*Nobby Poultry Farm	Black Orpingtons ...	145	530
T. Hindley	Do.	106	421
*E. Morris	Do.	147	408
*E. F. Dennis	Do.	133	406
*A. E. Walters	Do.	148	390
E. M. Larsen	Do.	119	377
*W. H. Reilly	Chinese Langshans ...	87	374
*W. Smith	Black Orpingtons ...	98	373
*J. W. Macrae	Do.	123	365
*Mars Poultry Farm	Do.	136	361
*R. Burns	Do.	141	345
*D. Fulton	Do.	149	310
W. J. Mee	Do.	67	298
A. Shanks	Do.	130	282
*F. A. Claussen	Rhode Island Reds ...	107	239
T. W. Lutze	Black Orpingtons ...	117	232
H. Puff	Rhode Island Reds ...	64	218
Jas. Fitzpatrick	Do.	69	142
Totals ... ..	...	6,804	23,080

* Indicates that the birds are engaged in the single hen test.

DETAILS OF SINGLE HEN TESTS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	93	95	104	88	98	101	579
G. W. Hinds	105	85	82	83	77	64	496
E. Chester	80	87	74	97	73	75	486
G. Howard	74	79	87	77	74	86	477
C. Knoblauch	75	70	91	76	84	80	476
C. P. Buchanan	80	71	84	72	87	80	474
T. Fanning	85	81	85	51	83	80	465

DETAILS OF SINGLE HEN TESTS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.

LIGHT BREEDS—*continued.*

Geo. Prince	47	87	82	82	81	82	461
Mrs. L. Henderson	76	83	77	43	86	93	458
W. Becker	75	74	58	88	68	84	447
G. H. Turner	37	56	85	84	98	83	443
W. Lyell	77	80	78	73	61	63	432
R. Holmes	87	77	66	65	60	75	430
O.K. Yards	64	81	83	66	79	54	427
L. G. Innes	67	91	94	45	36	78	411
Oakland Poultry Farm	60	69	78	80	61	61	409
E. A. Smith	47	86	73	85	73	43	407
Dr. Jennings	53	86	77	65	69	39	389
Range Poultry Farm	33	91	40	67	71	84	386
Thos. Taylor	38	76	76	54	64	73	381
C. Porter	28	71	71	51	75	76	372
Quinn's Post Poultry Farm	84	44	57	49	79	48	361
J. Zahl	77	61	69	66	46	34	353
Mrs. Coomber	38	73	57	60	34	81	343
J. M. Manson	81	73	84	28	15	29	310
Homalayan Poultry Farm	72	57	40	32	72	33	306
T. B. Hawkins	60	50	74	27	41	33	285
J. W. Newton	52	77	7	32	54	39	261
Mrs. R. Hunter	39	70	2	38	46	61	256

HEAVY BREEDS.

Nobby Poultry Farm	98	88	80	80	87	97	530
E. Morris	55	71	88	84	68	42	408
E. F. Dennis	91	68	62	17	97	71	406
A. E. Walters	62	83	49	71	89	31	390
W. H. Reilly	64	82	73	27	51	77	374
W. Smith	97	67	23	60	56	70	373
J. W. Macrae	37	31	84	56	76	81	365
Mars Poultry Farm	57	71	76	60	63	44	361
R. Burns	51	53	41	47	82	71	345
D. Fulton	57	60	38	39	13	103	310
F. A. Claussen	50	42	27	47	57	16	239

FEEDING MUSCOVY DUCKS.

By R. T. G. CAREY, Beerwah.

I have received a number of letters asking me what is the best thing to feed muscovy ducks with. It would take too much time to answer each one individually, therefore I wish to reply through the medium of the "Queensland Agricultural Journal." In feeding muscovy ducks, as in feeding other poultry, it must be done regularly, and if possible the meals should vary, selecting several of the best rations now in use. Muscovy ducks feed largely on vegetable and animal food, and do not thrive too well when fed on grains. In their natural state they are herbivora, the food being principally vegetable, together with small animals and insects, obtained in swamps, creeks, or lagoons, once their natural happy hunting ground. The supply of grain or seeds was almost unknown. As each mouthful of food is moistened with water before being swallowed, *water*, the chief and essential factor, must ever be abundantly supplied.

Muscovy ducks love freedom, although they stand confinement well. If given free range they can forage for themselves, and obtain a fair amount of their own

livelihood. Duck men like to give their breeders and laying birds three meals a day, such as a mash in the morning and at night, and a light lunch of grains at mid-day, thrown into the water troughs, but mostly cracked small, so as to make them occupy a longer time to get the grains eaten.

The following rations are best adapted for breeding and laying muscovies for the egg production. Feed twice daily all they will eat of equal parts of wheat, bran, corn meal, or maize meal and pollard. Add ten per cent. of beef scrap, or butcher's offal, liver, lungs, or heart, well minced (boiled potatoes, when cheap), or swede turnips, lucerne chaff scalded over night, with a few ounces of sand or grit thrown in. At noon supply a very light lunch of cracked corn or cracked wheat, given in water pans. Keep small sized grit, charcoal, oyster or sea shells constantly before them, in some receptacle within easy reach.

The mashes should always be mixed with *cold* water or soup. The food is never cooked for ducks. Curds of separated milk form a grand additional food; and are very fattening. Whey is also used to mix with the mash, instead of soup.

Great care must be exercised that breeders and layers do not run into fat. They must be kept in lean condition for egg production and fertility.

Drakes are separated when copulation periods are over, and brought back to condition for the next period of stud work. In fact, they are something like stud rams, stud horses, or bulls, in that they only serve at stated seasons, just when the females come to maturity, or after rearing a hatch. Therefore, do not over-supply the service. Four, six, or eight females are sufficient to mate at any one time. For that work, drakes need a more liberal supply of animal food.

Where marsupials are numerous and easily obtained, skin them, and let the drakes tear the flesh off as they like, but do not let it get rotten. If possible, supply a plunge bath; a tub sunk half-way into the ground acts well.

Muscovy ducks, unlike fowls, rove about at night, and are naturally night-feeders; and domestication has not weaned them of the disposition. Hence there is no harm in leaving any uneaten food remaining over in their troughs over night, as it will be all eaten up before sunrise. Although they appear to eat greedily, there is no fear of overfeeding, since when they are full they will sit in a shady snug corner for hours, in lazy mood, occasionally rising just to moisten their parched throats or bills with a dip or two into water.

When the muscovy mother leads her family of youngsters from the nest, their first instinct is for water, therefore, do not rush to feed them. Merely place a nice drink, with the chill taken off, in a low vessel. Add a few spoonfuls of sweet milk, and you will see how they enjoy that. After the ducklings have been taught where the drink is obtainable, add gradually to it a few ounces of pollard until the fourth day, when you may begin to feed by giving a mash made as follows:—Bran one part, pollard one part, maizemeal one part, one part of animal flesh, minced; or boil to a pulp any fresh beef scraps (not fats), liver, lungs, heart, or marsupial flesh; add a few pinches of grit, sharp sand, and also sea shells. Give all they will eat clean up of this mixture four times a day. The last thing before going to bed, see that a supply is available for midnight supper; also plenty of clean water in the drink vessel. Give no food to baby ducklings until they are thirty-six hours old. Then give a supply of food and fresh water, until they attain the age of one week. The above duckling mash can be used. Should the ducklings show any tendency to looseness at the bowels, a little ground charcoal is added to the ration. Water pans must be constantly emptied and kept clean, as they foul them so quickly; and be sure to have them shaded, as sun-heated drinking water creates more diseases and ailments than one might imagine.

Muscovy ducklings from eight to ten weeks old should have three meals per diem. Half part maizemeal, half part pollard, lucerne, several handfuls scalded soft, with beef slops or some animal offal, and three per cent. grit, sea shell, or oyster shell. At ten weeks they ought to be ready for market.

The proportions of these mashes are by measure or weight, and should always be mixed with cold water, and made dry and crumbly, never pasty or sloppy. Always keep drinking water close to the feed troughs, so as to enable them to rinse their mouths and clear their nostrils.

Preparing for the Market.—Having selected the young ducklings for rapid growth, they are now penned, and encouraged to become lazy, are fed with two measures of corn meal, two measures of pollard, one measure of bran, one measure of green stuff, half a measure of beef scraps, some Meggitt's meal soaked over night. Mix all together into a crumbly mash, feed four times a day. During the last week no green food is fed while the muscovies are being finished off.

Viticulture.

PRACTICAL HINTS ON ESTABLISHING A VINEYARD.—No. 4.

By P. MAHONEY.

PRUNING.

The methods proved by experiment by the most practical men for Australian conditions, and witnessed by the writer, are as under:—For spur-pruned vines of a non-vigorous nature:—

It is necessary to have two arms, each about 18 inches long, which is quite long enough, as long arms are likely to have too much barren wood. But this length should not be attained at one pruning. Say about 1 foot, or perhaps less, should be laid down at the first pruning after the vine has been established on the wire. This can then be extended at the rate of about 4 inches at each pruning until the desired length is attained. It is advisable and most profitable to have in such vines the fruiting wood as close as possible to the stem of the vine, for the fruit is superior, and heavier crops are obtained when these facts are borne in mind.

Never should spurs be allowed to grow from the underside of the main arm; they should be as near as possible on top of the arm, and consist of two buds and a base bud, making the cut through the node above the topmost bud retained, thus not exposing the readily-decomposing pitch. Benefit is also derived, for physiologists claim that in the spring time the bud withdraws all nourishment from the node immediately above it. It is far better to cut the spur back and start off from the base bud than to use a long-jointed, thin spur, for such spurs, in the course of time, are likely to be damaged by the implements used in working the ground.

Careful and judicious pruning should create a vine of about five years old with a series of spurs, that is, little crowns, containing three or four spurs, situated 8 or 9 inches apart, along the main arms. No spurs should be left on the stem of the vine.

A vigorous trailing vine is best trained with one arm, for the flow of sap is best regulated when trained in this manner, the length depending on the nature of the vine and quality of soil, from which the pruner is to form his own judgment. As stated, never should the desired length be laid down at one pruning, but extended at the rate of about 4 to 6 inches at each pruning, the initial length depending upon the constitution of the vine. These vines, when established, should also, as before mentioned, contain a series of spurs at about 8 or 9 inches apart along the main arm. Such vines should be trained with the prevailing winds, if any, for on that principle the vine does not suffer as much as it otherwise would from the strong winds. The T trellis is admirably adapted for the training of rod-pruned vines, as such a trellis allows all the fruiting wood to be on the same level. The main arms of a rod-pruned vine should each be about 9 inches to a foot long, and trained along the middle wire of the T trellis. The rods to be tied to the two outside wires, which are about 2 feet apart. It is not necessary to leave spurs from which to produce rods for the coming pruning, but with a little science the base buds on the rods which are to crop can be made to throw out shoots from their base buds to make rods for the following crops. This can be done by fracturing the rods just above the base bud, thus checking the flow of sap, and causing those buds to burst and grow into rods for next year's crop. The whole rod should be treated in this manner, thus causing all the buds along the rod to burst and be productive. They should also be wound tightly around the wire and tied firmly. Long and short rods fruit alike if treated in this manner. Avoid using these rods if possible, for the stouter they are the better. The number of rods to leave varies according to the constitution of the vine.

Spring and summer pruning consists of removing water shoots and other superfluous growth, in the very early stage of their development (these being of no value), so that the nourishment can be utilised by the fruit and useful canes. It is also necessary in forming the young vine. With a little science in pruning, spring and summer pruning can be greatly minimised, and perhaps altogether avoided.

Pinching off the sappy terminals of canes causes a temporary check, thus encouraging the buds to shoot, and it also induces a better sitting of fruit when the flowers are falling from the bunches.

[TO BE CONTINUED.]

Entomology.

TACHINID PARASITE OF THE CANE BORER WEEVIL.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from Dr. J. F. Illingworth, Entomologist:—

“ During the month we made a second trip to the Mossman district—this time for a supply of the tachinid parasite of the borer weevil. Though our stay was very brief, we were able to make the most of it, for we were offered every facility at the mill.

“ I was fortunate in locating an abundant supply of the parasites during my previous visit, for Mr. Crees, the manager, informed me that the borer is not very prevalent in the district. My search through hundreds of trucks of cane in the mill yard failed to reveal a trace of them. The particular field where the flies were found was an old nursery of seedling canes, which has had no trash burned—consequently an ideal condition for the borer to propagate. Then, too, in 1910, the breeding-cages from which the tachinid parasites escaped were located alongside this field and the flies have had a good chance to become established.

“ I was surprised to learn that all of the cane of the district is burned before cutting. This may account somewhat for the scarcity of the borers, for the fires destroy a large percentage of those that are left in the discarded canes; or the grubs succumb later to the action of the sun upon the exposed stalks. Furthermore, fully 50 per cent. of the cane grown is D1135, a variety so hard that the borers are not attracted to it. It was interesting to note how the borers picked out the softer varieties in the nursery, where they had a choice.

“ The mill, however, now pays on individual analysis, and this is tending to increase the growing of Clark's seedling and other canes of higher density.

“ Rats are by far the worst pest at Mossman. Soluble strychnine proved a failure, for the rats would not eat the bait. White arsenic has been used there with success; and ‘ Rat-nip,’ a trade preparation, containing phosphorus, also gave good results. These were applied to bits of bread and other kinds of food.

“ I was interested to note the scarcity of natural enemies of the tachinid parasites in the district. The exotic ant *Pheidole megacephala*, which proved such a mortal enemy to the young flies in Fiji, is present, though in moderate numbers. In a few cases I found that they had cleaned out the borer channels and were living in them. They are, however, not abundant enough to offer any serious menace to the flies. Furthermore, a considerable search amongst the cane leaves revealed only a single jumping spider. These predators, too, are so abundant in Fiji that often several are to be seen on one stalk. Swallows were rather abundant over the field, but I do not consider them a serious enemy to the tachinids.

“ DISTRIBUTION OF THE PARASITES.

“ My first intention was to bring all of the flies to the Mulgrave, where the borer beetles are proving themselves such a serious pest on the low-lying lands along the river. Very recently, however, I received a letter from the Babinda Association requesting my assistance in the placing of some of the parasites there. A visit to the district proved to me that the pest was very abundant, and particularly so in the region out around Moolaba.

“ I finally decided to liberate the flies from three centres—Moolaba, near the station; Babinda, Dr. Reid's farm; and Gordonvale, Mrs. Moller's farm. A cage has been established at the latter place for breeding the flies; and they are already emerging in considerable numbers.

“ IMPORTANCE OF THE HUMUS SUPPLY IN THE SOIL.

“ I have been making further investigations at Hambledon during the month. They certainly have the best system of supplying humus that I have seen. All the waste from the mill is composted and left for about a year before it is put on the land.

“ This compost is made by building up layers of the various by-products from the mill—filter-press, trash from the carriers, ashes from wood, megass, and so forth—nothing is permitted to go to waste; even dead animals are buried in the pile.

"About thirty loads of this, or about 20 tons, are applied to the acre. It is certainly a very valuable fertilizer, and the cane shows a marked increase in growth where it has been applied. There is one block near the residence of Mr. A. L. Walker (who, by the way, is a grower of keen perception) which is a most excellent experiment. Part of this he treated with the compost, leaving the remainder. The treated cane is almost a foot taller than the other.

"The soil on this farm scours well, and for this reason it is an easy matter to work in trash. Mr. Walker tells me that he leaves the trash from the two last ratoon crops—i.e., volunteering the last ratoons by simply relieving over the rows. After the last crop is cut he ploughs in this double trash and applies compost, or a green crop, which is worked in preparatory to a new series of cane.

"In one field, which he was preparing for September planting at the time of my visit, a bean crop had been turned under, then the soil was treated with about 20 tons of compost. At this third ploughing, the soil was distinctly blackened by the rich supply of humus; and though the surface was clean, Mr. Walker told me that he means to give it five ploughings altogether before planting, to get it in perfect tilth. Is it any wonder that he cuts 50-ton crops without other fertilizers, on land that was once thoroughly infested with white grubs?

"Digging pits in these fields disclosed a fair number of grubs and several of the cocoons of the parasites (wasps), as reported last month. The grubs are the largest that I have seen, which is probably due to the fact that they are so well fed on the compost.

"IMPLEMENTS FOR RED VOLCANIC SOILS.

"Evidently we have not the proper implements for these loose red soils, for it is the general practice among growers to destroy as much trash as possible before ploughing, because they are unable to turn it under.

"There is a crying need for a machine that will chop up the trash, or treat it in some way so that it may be put in by the plough. Perhaps the rolling cutter, which is used for corn stalks in America, would work. It is a heavy implement, drawn by a pair of horses, and the blades are cross-wise of the row. It cuts all the stalks and trash into pieces about one foot long.

"The new American sulky plough with a motor attachment for cutting up weeds and putting them under has received a lot of attention in our magazines; and I was interested in reading in the July Sugar Journal that its fame has reached Australia, through the moving pictures. We, too, are anxious to see it turned loose on heavy cane trash.

"We were able to put under a very heavy crop of Mauritius beans on our experimental plots at Meringa by rolling the vines well just ahead of the ploughs. Treated in this way the discs of the ploughs, if sharp, will cut through the vines easily, providing they are not too old. It is best to turn them under when they are in flower, before the pods are set. If the seed is permitted to ripen there is trouble in store for ever after. Not only are the vines tough and hard to cut, but the dry beans continue to germinate in the soil for many months—some even coming along to climb over and smother the cane after it is laid by.

"LATE PLANTING.

"This is one of the principal subjects of discussion at this season; and, recently, several have told me that they have known late planting to fail because of grubs. It appears that the principal difficulty is due to the lack of cultivation. Investigations, in several instances, showed that the soil became too wet for working just at the time that the beetles were flying.

"It must be made clear, then, that late planting will only succeed on soils which are so easily drained that they may be thoroughly worked through December and January. Most of our red volcanic soils are of this character, and these are the ones that are usually infested when planted early. Let me emphasise that it is *thorough cultivation during the flight of the beetles* that does the business; and that late planting is only to facilitate this.

"I feel confident that the problem can be handled best on the heavy wet soils by the application of abundant humus. Since these soils scour well, trash and green-crops can be easily worked into them. After this preparation, I would advise early planting, for there is no question that this is best where it will succeed. The point here is, that the grubs will leave the growing roots alone if the soil is rich in organic matter."

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR AUGUST, 1918.

Article.								AUGUST.	
								Prices.	
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.	
Barley	...	...	...	...	...	...	bush.	2s. 6d. to 4s.	
Bran	...	...	...	...	...	...	ton	£4 15s.	
Broom Millet	...	...	...	...	...	...	"	£60 to £90	
Broom Millet (Sydney price)	...	...	...	...	...	...	"	£60 to £90	
Butter (First Grade)	...	...	...	...	...	...	cwt.	128s. 6d.	
Chaff, Mixed	...	...	...	...	...	...	ton	£3 10s. to £7 10s.	
Chaff, Oaten	...	...	...	...	...	...	"	£5 to £8	
Chaff, Lucerne	...	...	...	...	...	...	"	£3 to £12 15s.	
Chaff, Wheaten	...	...	...	...	...	...	"	£4 10s.	
Cheese	...	...	...	...	...	...	lb.	7½d. to 10½d.	
Flour	...	...	...	...	...	...	ton	£12	
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.	
Hay, Oaten	...	...	...	...	...	...	ton	...	
Hay, Lucerne	...	...	...	...	...	...	"	£3 10s. to £5	
Hay, Wheaten	...	...	...	...	...	...	"	£4 10s. to £5	
Honey	...	...	...	...	...	...	lb.	3½d. to 4d.	
Maize	...	...	...	...	...	...	bush.	5s. to 5s. 3d.	
Oats	...	...	...	...	...	...	"	3s. 3d. to 4s.	
Onions	...	...	...	...	...	...	ton	£20	
Peanuts	...	...	...	...	...	...	lb.	4d. to 5d.	
Pollard	...	...	...	...	...	...	ton	£5	
Potatoes	...	...	...	...	...	...	"	£5 to £10 10s.	
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	3s. to 3s. 6d.	
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£4 to £5	
Eggs	...	...	...	...	...	...	doz.	11d. to 1s. 3d.	
Fowls	...	...	...	...	...	...	per pair	3s. 6d. to 8s.	
Ducks, English	...	...	...	...	...	...	"	3s. to 4s.	
Ducks, Muscovy	...	...	...	...	...	...	"	4s. to 8s. 6d.	
Geese	...	...	...	...	...	...	"	9s. to 11s. 6d.	
Turkeys (Hens)	...	...	...	...	...	...	"	9s. to 13s.	
Turkeys (Gobblers)	...	...	...	...	...	...	"	15s. to 27s.	
Wheat (Milling)	...	...	...	...	...	...	bush.	4s. 6d.	

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	8s. to 13s.
Beetroot, per dozen bunches	...	...	...	...	...	...	9d. to 1s. 9d.
Cabbages, per dozen	...	...	...	...	...	...	1s. 6d. to 5s.
Carrots, per dozen bunches	...	...	...	...	...	...	9d. to 1s. 9d.
Cauliflowers, per dozen	...	...	...	...	...	...	3s. to 10s.
Chokos, per quarter-case	...	...	...	...	...	...	3d. to 1s. 9d.
Cucumbers, per dozen	...	...	...	...	...	...	...
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 6d.
Marrows, per dozen	...	...	...	...	...	...	1s. 6d. to 3s. 6d.
Parsnips, per dozen bunches	...	...	...	...	...	...	9d. to 1s. 9d.
Peas, per sugar-bag	...	...	...	...	...	...	6s. to 10s.
Sweet Potatoes, per cwt.	...	...	...	...	...	...	3s. to 3s. 6d.
Table Pumpkins, per cwt.	...	...	...	...	...	...	3s. 6d. to 4s. 6d.
Tomatoes, per quarter-case	...	...	...	...	...	...	2s. 6d. to 7s.

SOUTHERN FRUIT MARKETS.

Article.	AUGUST.			
	Prices.			
Bananas (Queensland), per case	12s. to 15s.
Bananas (Tweed River), per case	14s. to 20s.
Bananas (Fiji), per bunch...	9s. to 11s.
Bananas (G.M.), per bunch	9s. to 11s.
Bananas (G.M.), per case	22s. to 23s.
Lemons (local), per bushel-case	5s. to 6s.
Mandarins, per bushel-case	1s. to 13s.
Oranges (Navel), per case	8s. to 12s.
Oranges (Queensland), per case	5s. to 9s.
Oranges (Other), per case...
Papaw Apples, (Queensland), per quarter-case
Passion Fruit, per quarter-case	6s. to 8s. 6d.
Pears, per bushel case	15s. to 20s.
Pineapples (Queens), per double-case	8s. to 10s.
Pineapples (Ripleys), per double-case	6s. to 8s.
Pineapples (Common), per double-case	6s. to 8s.
Tomatoes (Queensland), per half-case

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	AUGUST.			
	Prices.			
Apples, Eating, per bushel-case	7s. to 13s.
Apples, Cooking, per bushel-case	8s. to 11s.
Bananas (Cavendish), per dozen	2d. to 6d.
Bananas (Sugar), per dozen	2d. to 6d.
Cape Gooseberries, per quarter-case	8s. to 13s.
Citrons, per hundredweight	8s.
Cocanuts, per sack	15s. to 25s.
Cumquats, per quarter-case
Custard Apples, per quarter-case	3s. to 5s.
Lemons (Lisbon), per quarter-case	5s. to 7s. 6d.
Mandarins, per case	5s. to 14s.
Oranges (Navel), per case	6s. to 10s. 6d.
Oranges (Seville), per hundredweight	14s.
Oranges (Other), per case	3s. to 6s.
Papaw Apples, per quarter-case	1s. 3d. to 2s. 6d.
Passion Fruit, per half bushel-case	6s. to 11s.
Peanuts, per lb.	4d. to 6d.
Pineapples (Ripley), per dozen	6d. to 2s.
Pineapples (Rough), per dozen	6d. to 1s. 6d.
Pineapples (Smooth), per dozen	1s. to 3s. 6d.
Pomelos (poor man's orange) per hundredweight
Rosellas, per sugar bag
Strawberries, per dozen boxes	6s. to 13s. 6d.
Tomatoes, per quarter-case	2s. 6d. to 9s.

TOP PRICES, ENOGGERA YARDS, JULY, 1918.

Animal.	JUNE.	
	Prices.	
Bullocks	£23 17s. 6d. to £27 5s.	
Cows	£15 2s. 6d. to £20 10s.	
Merino Wethers	45s.	
Crossbred Wethers	50s.	
Merino Ewes	29s.	
Crossbred Ewes	30s.	
Lambs	39s. 3d.	
Pigs (Porkers)	50s.	

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.		AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.		AVERAGE RAINFALL.		TOTAL RAINFALL.	
		July.	No. of Years' Records.	July, 1918.	July, 1917.			July.	No. of Years' Records.	July, 1918.	July, 1917.
<i>North Coast.</i>						<i>South Coast—continued:</i>					
		In.		In.	In.			In.		In.	In.
Atherton		0·90	17	0·68	0·30	Nambour		2·67	22	0·87	0·36
Cairns		1·52	36	2 80	Nil	Nanango		1·77	36	0·15	0·52
Cardwell		1·44	46	0·51	0·40	Rockhampton		1·48	31	0 04	0·41
Cooktown		0 96	42	2·40	0·09	Woodford		2·59	31	Nil	0·27
Herberton		0·62	31	0·99	0·22	<i>Darling Downs.</i>					
Ingham		1·59	26	0·41	0·09	Dalby		1·83	48	0·09	0·67
Innisfail		4·65	37	3·75	0·54	Emu Vale		1·45	...	0·38	0·74
Mossman		1·46	10	1·48	0·02	Jimbour		1·75	...	0·04	0·60
Townsville		0·55	47	Nil	Nil	Miles		1·83	33	0·02	0·81
<i>Central Coast.</i>						Stanthorpe		1·97	45	0·59	1·57
Ayr		0·56	31	0·18	Nil	Toowoomba		2·02	46	0·44	0·47
Bowen		0·95	47	0·09	Nil	Warwick		1·81	31	0·23	0·77
Charters Towers		0·56	36	Nil	Nil	<i>Maranoa.</i>					
Mackay		1·64	47	1·45	Nil	Roma		1·43	44	0·24	0·23
Proserpine		1·04	15	1·03	Nil	<i>State Farms, &c.</i>					
St. Lawrence		1·26	47	0·10	Nil	Bungeworgorai		1·18	4	0·24	0·14
<i>South Coast.</i>						Gatton College		1·38	...	0·16	0·40
Biggenden		1·34	...	0·30	0·65	Gindie		1·16	...	0·07	0·37
Bundaberg		1·99	35	0·40	0 22	Hermitage		1·50	...	0·35	0·92
Brisbane		2·25	67	0·17	0·55	Kairi		0·90	4	0 84	Nil
Childers		1·71	23	0·38	0·23	Kamerunga		1·38	...	1·96	0·02
Crohamhurst		2·92	25	0·32	0·57	Sugar Experiment Station, Mackay		1·35	10	0·97	Nil
Esk		1 99	31	0·15	0·63	Warren		0·95	4	Nil	0·70
Gayndah		1·53	47	0·27	0·73						
Gympie		2·18	48	0·39	1·14						
Glasshouse M'tains		2·37	10	0·27	0 22						
Kilkivan		1·76	39	0 59	0·85						
Maryborough		1 99	47	0·40	0·53						

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6·3	5·34	5·29	5·47	4·59	6·5	4·46	6·28	<p>The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.</p> <p>H. M.</p> <p>5 Sept. ● New Moon 8 44 p.m.</p> <p>14 „ ☾ First Quarter 1 3 a.m.</p> <p>20 „ ○ Full Moon 11 1 p.m.</p> <p>27 „ ☾ Last Quarter 2 39 p.m.</p> <p>The Moon will be farthest from the earth on the 8th, and nearest to it on the 21st.</p>
2	6·2	5·34	5·27	5·47	4·58	6·5	4·46	6·28	
3	6·1	5·35	5·26	5·48	4·57	6·6	4·46	6·29	
4	6·0	5·35	5·25	5·48	4·56	6·7	4·46	6·30	
5	5·59	5·36	5·24	5·49	4·55	6·8	4·46	6·31	
6	5·58	5·36	5·22	5·50	4·54	6·9	4·46	6·32	<p>The Moon will be farthest from the earth on the 8th, and nearest to it on the 21st.</p> <p>5 Oct. ● New Moon 1 5 p.m.</p> <p>13 „ ☾ First Quarter 3 0 p.m.</p> <p>20 „ ○ Full Moon 7 35 a.m.</p> <p>27 „ ☾ Last Quarter 3 35 a.m.</p> <p>The Moon will be farthest from the earth on the 6th, and nearest to it on the 20th.</p>
7	5·57	5·36	5·21	5·50	4·54	6·9	4·46	6·32	
8	5·56	5·37	5·20	5·51	4·53	6·10	4·46	6·33	
9	5·54	5·37	5·19	5·51	4·53	6·10	4·46	6·34	
10	5·53	5·38	5·18	5·52	4·52	6·11	4·47	6·35	
11	5·52	5·38	5·17	5·52	4·52	6·12	4·47	6·35	<p>4 Nov. ● New Moon 7 2 a.m.</p> <p>12 „ ☾ First Quarter 2 46 a.m.</p> <p>18 „ ○ Full Moon 5 33 p.m.</p> <p>25 „ ☾ Last Quarter 8 25 p.m.</p> <p>The Moon will be farthest from the earth on the 2nd and 29th, and nearest on the 17th.</p>
12	5·51	5·39	5·16	5·52	4·51	6·13	4·47	6·36	
13	5·50	5·39	5·16	5·53	4·51	6·13	4·48	6·36	
14	5·49	5·40	5·15	5·53	4·50	6·14	4·48	6·37	
15	5·47	5·40	5·15	5·53	4·50	6·15	4·49	6·37	
16	5·46	5·41	5·14	5·54	4·49	6·16	4·49	6·38	<p>4 Dec. ● New Moon 1 19 a.m.</p> <p>11 „ ☾ First Quarter 12 31 p.m.</p> <p>18 „ ○ Full Moon 5 18 a.m.</p> <p>25 „ ☾ Last Quarter 4 31 p.m.</p> <p>The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th.</p> <p>There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.</p>
17	5·45	5·41	5·13	5·54	4·49	6·17	4·50	6·38	
18	5·44	5·41	5·12	5·55	4·48	6·17	4·50	6·39	
19	5·43	5·42	5·11	5·55	4·48	6·18	4·50	6·39	
20	5·42	5·42	5·10	5·56	4·48	6·19	4·51	6·40	
21	5·41	5·43	5·9	5·56	4·48	6·20	4·51	6·40	<p>4 Dec. ● New Moon 1 19 a.m.</p> <p>11 „ ☾ First Quarter 12 31 p.m.</p> <p>18 „ ○ Full Moon 5 18 a.m.</p> <p>25 „ ☾ Last Quarter 4 31 p.m.</p> <p>The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th.</p> <p>There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.</p>
22	5·40	5·43	5·8	5·57	4·47	6·21	4·52	6·41	
23	5·39	5·44	5·7	5·58	4·47	6·21	4·52	6·41	
24	5·37	5·44	5·7	5·58	4·47	6·22	4·53	6·42	
25	5·36	5·44	5·6	5·59	4·47	6·23	4·54	6·42	
26	5·35	5·45	5·5	5·59	4·46	6·24	4·54	6·43	<p>The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th.</p> <p>There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.</p>
27	5·33	5·45	5·4	6·0	4·46	6·25	4·55	6·43	
28	5·32	5·46	5·3	6·1	4·46	6·25	4·55	6·44	
29	5·31	5·46	5·2	6·2	4·46	6·26	4·56	6·44	
30	5·30	5·46	5·1	6·3	4·46	6·27	4·56	6·45	
31	5·0	6·4	4·57	6·45	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during September, October, and November may be roughly arrived at by adding 16 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Orchard Notes for October.

THE SOUTHERN COAST DISTRICTS.

As October is often a dry month throughout the greater part of the State, one of the most important duties of the fruitgrower is to keep his orchard or vineyard in a thorough state of cultivation, thus retaining the moisture in the soil that is essential to the setting and development of the fruit crop. As long as the land is level one cannot over-cultivate, as there is no danger of the soil washing, but when the orchard is on a hillside heavy thunderstorms, which may occur during the month, are very apt to cause heavy washaways of soil if the land is kept in the high state of tilth necessary to retain moisture. In this case the cultivation should always be across and not up and down the face of the hill, and where the soil is of such a nature that it will wash badly thin blocks, consisting of a row or two of a growing crop or of light timber, brushwood, or even a body of weeds or heavy mulching, should be provided, such blocks to follow the contour of the orchard. If dry, and water for irrigation is available, citrus trees will be the better for a thorough watering during the month. Give the trees a good soaking, and follow the irrigation by systematic cultivation, as this is much better than constant surface watering, as practised by the Chinese. Examine the orchard and vineyard carefully for pests of all kinds. When young trees are showing signs of scale insects, cyanide same; when leaf-eating insects of any kind are present, spray the plants that are being attacked with arsenate of lead. Look out carefully for black spot and oidium in grape vines, using Bordeaux mixture for the former and sulphur for the latter. When using sulphur, see that you get a fine sample—viz., one in which the particles of sulphur are in a very fine state, as the finer the sulphur the better the results. Do not apply the sulphur in the early morning, but during the heat of the day, as it is the sulphur fumes, not the sulphur, which do the good. A knapsack sulphurer is the best machine for applying sulphur to grape vines, trees, or plants.

Examine any late citrus fruits or early summer fruits for fruit-fly, and take every precaution to keep this great pest in check now, as, if fought systematically now, it will not do anything like the same amount of damage later on as if neglected and allowed to increase unchecked. October is a good month for planting pineapples and bananas. Be sure and have the land properly prepared prior to planting, especially in the case of pineapples, as the deeper the land is worked and the better the state of tilth to which the surface soil is reduced the better the results, as I am satisfied that few crops will pay better for the extra work involved.

THE TROPICAL COAST DISTRICTS.

As the fruit-fly usually becomes more numerous at this time of year, especial care must be taken to examine the fruit thoroughly prior to shipment, and to cull out all fruit that has been attacked by the fly. Banana and pineapple plants may be set out, and the orchards should be kept well tilled so as to have the land clean and in good order before the heavy summer growth takes place.

All the spring crops of citrus fruits should be now marketed, and the trees, where necessary, should be pruned and sprayed, and the land be well ploughed. The ploughing should be followed by harrowing and cultivating, so as to get the surface of the land in good order. Granadillas and papaws should be shipped to the Southern markets, as, if care is taken in packing and they are sent in the cool chamber, they will carry in good order. These fruits should not be gathered in an immature condition, as, if so, they will never ripen up properly. They should be fully developed but not soft, and if gathered in this condition, carefully handled, and packed and shipped in cool storage, they will reach the Southern markets in good condition, and, once they become commonly known, will meet with a ready sale.

THE SOUTHERN AND CENTRAL TABLELANDS.

In the Stanthorpe district the spraying of apple, pear, and quince trees for codling moth will have to be carefully carried out, the best spray being arsenate of lead, of which there are several reliable brands on the market.

When fungus diseases, such as powdery mildew, &c., are also present, Bordeaux mixture should be combined with the arsenical spray.

The vineyard will require considerable attention, as the vines must be carefully disbudded, and any signs of oidium or black spot should be checked at once. Look out for late spring frosts, and, if possible, try the effect of smudge fires producing dense smoke for preventing any damage.

Keep the orchards and vineyards well cultivated, as it is of the utmost importance to keep the moisture in the soil at this time of the year if a good fruit crop is to be secured.

In the warmer districts cultivation is all-important, and when irrigation is available it should be used for both fruit trees and vines, a thorough soaking followed by systematic cultivation being given.

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, sorghum, setaria, imphee, prairie grass, panicum, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred. The planting of the sisal agave and the fourcroya may be proceeded with at any time of the year, but the best time is in spring and beginning of summer, when warm weather and good showers will enable the young plants to root quickly and become firmly established before the winter. The demand for the fibre is constantly increasing, and the supply does not nearly overtake the demand, but, owing to the want of shipping facilities no oversea shipments can be made. Hence, the price of the fibre is abnormally high, up to £95 and £100 per ton. Plant only on dry or well-drained soil. Cotton may still be sown.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of all kinds of vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Give plenty of water and mulch tomato plants planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant chrysanthemums, gladiolus and other bulbs, such as tuberose, crinum, ismene, amaryllis, paneratum, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphis, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

General Notes.

A POTATO TEST.

Before buying potatoes (says "The Journal of the Jamaica Agricultural Society"), cut a sample potato in half. Put the two cut ends together. If they stick, the potato is good and mealy; if they slide apart, the potato is watery and of poor quality.

PICKLE FOR HAM.

Honey in place of sugar is used in brine for curing ham, and is highly recommended; it is said to be a favourite in France. The brine calls for 4 lb. of coarse salt, 1 oz. of saltpeter, 2 lb. of honey, and 2 gallons of water. Let the brine stand for twenty-four hours; then immerse the meat in it and let it stay in pickle for six weeks.

TREATMENT OF TRAVEL-TRIED TREES.

"South African Gardening" writes:—

"The South African Railways never earned too good a reputation for prompt handling of perishable goods. They could not be expected to have improved since the outbreak of war, and they certainly have not.

"Judging from our own experiences, there are likely to be some trying journeys before fruit and rose trees this planting season, and many parcels will doubtlessly arrive at their destinations in a dry, shrivelled condition.

"When this happens there is no need to despair. If they are not very bad, plunging them bodily in a barrel or tank of water for a few hours will probably restore plumpness.

"In bad cases, they will revive better if buried in moist soil for a week or ten days. Just dig out a deep wide trench, lay the trees bodily, and cover them over with soil. Occasional examination will prove to what extent they have been restored to a normal state, and when this is complete they can be dug up and planted in the usual way."

[A few years ago a consignment of young orange-trees was sent from Brisbane to New Guinea. They arrived, although carefully packed in stout cases, in very bad condition. Somebody at Port Moresby advised placing them in a trench as above described, and several trees recovered; and, after planting, these revived and did well.—Ed., "Q.A.J."]

PRESERVING EGGS.

Firstly, get an earthenware crock or jar, which is the best receptacle; failing this a small barrel (pork or beef) well cleaned out; or a kerosene tin, which serves fairly well. Secondly, bear in mind that the eggs must be perfectly fresh, not sat upon even a night or day, must not be soiled, and if infertile, all the better. Infertile eggs keep and eat much better. When about to arrange for preserving eggs, we confine the cocks for a week before and during the process of collecting the eggs for preserving.

Waterglass is the best preservative, but when this cannot be obtained, the lime method is the next best. Many consider this method entirely satisfactory, though instances are known where eggs so preserved have tasted slightly of lime. To prepare the lime water, dissolve 2 or 3 lb. of unslaked lime in 5 gallons of water that has previously been boiled and allowed to cool, and allow the mixture to stand until the lime settles and the liquid is clear. Place clean, fresh eggs in the vessel and pour the clear limewater into the vessel until the eggs are covered. At least 2 in. of the solution should cover the top layer of eggs. Sometimes 1 lb. of salt is used with the lime, but experience has shown that in general the lime without the salt is quite satisfactory.

Place the crock containing the preserved eggs in a cool, dry place, well covered to prevent evaporation. Waxed paper covered over and tied around the top of the crock will answer this purpose.

Using Preserved Eggs.—Fresh, clean eggs, properly preserved, can be used satisfactorily for all purposes in cooking and for the table. When preserved eggs are to be boiled, a small hole should be made in the shell with a pin at the large end before placing them in the water. This is done to allow the air in the egg to escape when heated so as to prevent cracking. ("Journal of the Jamaica Agricultural Society.")



INCREASED MILK YIELD

invariably follows on the use of the Tonic Salt Blocks.

Leslie Salt Licks

They assure at least 10 per cent. increase in returns, because they increase the milk flow and improve the quality of the fat globules in the milk. This means Richer Cream—Better Butter—AND MORE OF IT!

They increase the flow of saliva—hence digestion is simplified and the cow must increase its yield of milk.

They keep the cows well-conditioned and fortify them against epidemics. These Licks have been found an effectual PREVENTATIVE against Redwater, Abortion, and TUBERCULOSIS. By improving the digestion they safeguard the stock from Impaction, Cripples, Rickets, and other common ailments to such an extent that losses from these causes are reduced very considerably.

Milk from cows that have been correctly "salted" will be found to be free from taints and to keep fresh much longer than any milk.

The milking period can be carried to its full extent because the nourishing ingredients in the Licks supply the constituents for the bones and tissues of the unborn calf.

2/- per block, or 22/6 per case of one dozen.

WHOLESALE FROM—

Buzacott & Co. Ltd.
Smellie & Co. Ltd.
Siemon & Sons Ltd.

Adelaide St., Petrie's Bight, Brisbane.
Brisbane, Cairns, Ayr.
Brisbane, Ipswich, Townsville, and
Charters Towers.

New Zealand Loan & Mercantile Agency Co. Ltd.

G. & W. Barter
Butler Bros.
Hooker Chapman & Co.

Eagle Street, Brisbane.
South Brisbane and Toowoomba.
Charlotte Street, Brisbane.
Edward Street, Brisbane.

Country Orders—Freight to be Added.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. X.

OCTOBER, 1918.

PART 4.

Agriculture.

CORNGROWING COMPETITION, 1918-19.

1. This competition will be open to all under the age of eighteen years who are residents of the State of Queensland. An entrance fee of 2s. 6d. must be forwarded to the Under Secretary with the application to enter.

2. Applications to be enrolled in the competition, containing the following particulars, must be forwarded to the Under Secretary, Department of Agriculture and Stock, Brisbane, to reach him, if possible, not later than 29th September, 1918:—

- (a) Full name and address. (Give Christian names in full.)
- (b) Date of birth. (Day, month, and year.)
- (c) No. of Division in which applicant resides, and the name of the Dairy Inspector who supervises the locality.

3. The area to be devoted to the planting of the seed maize shall be one-tenth of an acre, selected seed for which, $1\frac{1}{4}$ lb. of Improved Yellow Dent, will be posted, free of cost.

4. Each competitor shall have absolute freedom in his choice of ground, and in the methods he may adopt in preparing, planting, and cultivating his plot; but in no case shall a plot exceed one-tenth of an acre. Yields will be calculated, when judging, on the basis of this area.

The following table shows the length the rows must be to give the exact area according as four, five, six, or more rows are planted:—

Number of Rows Four Feet Apart.	Length of Rows in Feet.	Number of Rows Four Feet Apart.	Length of Rows in Feet.
4	272 ft. 3 in.	8	136 ft. 1½ in.
5	217 ft. 10 in.	12	90 ft. 9 in.
6	181 ft. 6 in.	16	68 ft.
7	155 ft. 7 in.		

5. Each competitor will be required to keep a record chart showing the dates and particulars of the different stages of work, and these charts must be delivered, at the time of harvesting, to the officer appointed for superintending and verifying the yield, and this officer will post them on to Brisbane.

6. Within seven days from the verification of the yield from the crop, each competitor shall select, without aid from other persons, twelve uniform cobs of the maize from his crop, and forward them, with a letter of advice, to the Department of Agriculture and Stock, Brisbane. (The cobs should be packed in straw envelopes, commonly used in packing beer bottles, and then placed tightly in a case which should be labelled and branded with the initials of the competitor and the number allotted to his district.)

7. Competitors must notify the Dairy Inspector for the district of the date when the crop shall have matured and be ready for inspection. *Unless this rule is observed the competitor will be disqualified.* The maize *must* be thoroughly dry and ripe when harvested.

8. No competitor shall be allowed to employ or permit any labour upon the competition plot standing in his name, other than his own personal labour, excepting in relation to the driving of horses, for which, owing to circumstances, such help may be needed.

9. The competition will close on the 30th June, 1919, and the prizes will be allotted thus—

The competitors will be grouped according to the following divisions:—

(4) The district supervised by—

Mr. E. W. Ladewig, Dairy Inspector, Beenleigh.

Mr. L. J. Kelly, Dairy Inspector, Harrisville.

Mr. A. K. Henderson, Dairy Inspector, Rosewood.

(2) The district supervised by—

Mr. C. C. Pickering, Dairy Inspector, care of Miss Macpherson, Victoria street, West End

Mr. R. G. Ridgway, Dairy Inspector, Ellerslie Crescent, Taringa, Brisbane.

Mr. L. J. Verney, Caboolture.

Mr. R. Winks, Dairy Inspector, Gympie.
Mr. J. A. Midgley, Dairy Inspector, Bundaberg.
Mr. W. S. Harding, Dairy Inspector, Esk.

(3) The district supervised by—

Mr. J. H. Barber, Dairy Inspector, Crow's Nest.
Mr. J. J. Carew, Dairy Inspector, Gatton

(4) The district supervised by Mr. S. K. Crowther, Dairy Inspector, Kingaroy

(5) The district supervised by—

Mr. J. D. Ogilvie, Dairy Inspector, Clifton.
Mr. S. A. Clayton, Toowoomba.
Mr. J. R. D. Munro, Dairy Inspector, Warwick.

(6) The district supervised by Mr. D. Downs, Dairy Inspector, Gayndah.

(7) The district supervised by—

Mr. J. Cattanaach, Dairy Inspector, Dalby.
Mr. R. S. Sigley, Dairy Inspector, Roma.
The Stock Inspector, Goondiwindi.

(8) The Central District of Queensland, including that supervised by Mr. L. Moriarty, Dairy Inspector, Rockhampton.

(9) The Northern district of Queensland, including that supervised by—

Mr. G. A. Smith, Stock and Dairy Inspector, Mackay.
Mr. J. P. Carey, Yungaburra.

10. Three special prizes of the value of £10, £5, and £3 will be awarded to the competitors who stand first, second, and third in the entire competition.

DISTRICT PRIZES.—FIRST, £5; SECOND, £2; THIRD, £1.

If there are less than six competitors, prizes will be allotted as follows:—

Four to five competitors (inclusive), two prizes, first and second.

Two to three competitors (inclusive), one prize only, first.

When only one competitor, he or she will be debarred from participating in the District Prize, but will be eligible to compete for the Special Prizes.

NOTE.—It is in the interest of the entrants to encourage others to compete for the valuable prizes being offered.

No money prizes will be given, but each successful competitor will be allowed to select some article to the value of his prize.

No prize will be awarded unless the yield of corn equals 20 bushels per acre. This stipulation may be waived under very exceptional circumstances in the case of a lower yield.

11. The aggregate points will be 100, and the judging will be based upon the following:—

	Points.
(a) Quality of maize produced	15
(b) Yield of plot	75
(c) Notes and records of plot	10

12. The Director of Agriculture will be the sole judge of the competition, and his decision shall be final.

WILLIAM LENNON,

Secretary for Agriculture and Stock.

Brisbane, 2nd September, 1918.

COTTON IN THE WEST INDIES.

The following notes on the cotton-growing industry in the Barbados are published in the Annual Report of the Department of Agriculture of Tortola for 1918, and show the results of the operations of the Government Cotton Factory during the season 1916-1917:—

For some years past the putting into operation of a profit-sharing scheme in connection with the working of the Government Cotton Factory has been under discussion. Local opinion was opposed to the scheme.

However, it was decided to put a profit-sharing scheme into force. Under that scheme, a first payment of up to 5c. per lb. of seed-cotton is made, and any profits remaining after all accounts concerning the crop have been made up are to be divided as follows:—To the Government 25 per cent. and to the contributing growers 75 per cent. Quite how the scheme would have worked in a normal season it is impossible to say. There was a promise of an excellent crop of cotton, but this promise was not fulfilled on account of the gale. High prices led to the intervention of private speculators, who bought a good deal of the seed-cotton, and exported it to St. Kitts.

The combined effect was a large drop in the amount of cotton dealt with at the Government Ginnery.

The ginnery was opened for the purchase of seed-cotton on 21st October, 1916, and purchasing was continued each week till 5th May. During that time 57,570 lb. of seed-cotton was bought and dealt with.

The 57,570 lb. of seed-cotton yielded 15,253 lb. of clean lint, or 26.4 per cent.

The net cost of ginning, baling, and shipment to St. Thomas and St. Kitts, after deducting £16 17s. 3d., value of stores carried forward, amounted to £109 11s. 11d., or 3.6c. per lb. of clean lint. This high cost is accounted for by the price of baling material, fuel, and lubricating oils, and, in some degree, by the fact that large quantities of cotton can be dealt with at a cheaper rate in proportion than small lots.

THE JERUSALEM ARTICHOKE.

Although this is one of our most excellent and most easily grown vegetables, strange to say it is only cultivated to a very limited extent in this State by either farmers or market gardeners. It is not only of great value as human food but is an excellent and profitable crop for feeding swine, which thrive remarkably well upon the tubers. The so-called Jerusalem artichoke is really not what its name implies. The true artichoke is a chard or thistle, of which the bottoms of the flowers and the rib-like sepals are used as food. The botanical name of this true artichoke is *Cynara scolymus*; the so-called Jerusalem artichoke is *Helianthus tuberosus*, one of the sunflowers. The name Jerusalem is simply a corruption of the word "Girasole," which the Italians give to both the sunflower and the Jerusalem artichoke, meaning turning to the sun. The stems, leaves, and flowers bear a great resemblance to the Japanese sunflower. It is, in fact, a tuber-bearing sunflower, whose value lies in its tubers, which grow clustered in large numbers round the roots, and resemble knotty English potatoes. It is a very hardy plant, and may

be cultivated successfully in any fairly good soil in all except the most arid regions. It thrives, however, to the greatest perfection in moderately rich, sandy loam, with a moderate amount of moisture. In low-lying or ill-drained soil the tubers will quickly rot away. It is essentially a drought-resisting plant.

The cultivation is extremely simple, and does not call for any extra care or skill. All that is needed is that the land be ploughed or dug deeply and thoroughly pulverised. The tubers are then planted at a shallow depth (4 to 5 inches) in rows 3 feet apart and 18 inches between the sets. It takes about 15 lb. of tubers to plant a rod (16 perches) of land. As in the case of potatoes, the smaller tubers may be planted whole and the larger cut into sets containing two or three eyes. The plants grow to a height of from 4 to 6 feet. The best time to plant is early in the spring, or in July and August, and the tubers will be uninjured in the ground until the soil is warm enough to cause them to sprout. In ordinary seasons, the crop will be ready for digging in from five to six months. If not required for immediate use, they may be left in the ground and taken up at any time, and do not suffer injury from frost. If dug, they should not be exposed to the air, as they will not keep long without shrivelling up and becoming soft. They may, however, be pitted like sweet or English potatoes.

Independent of its value as a vegetable, the Jerusalem artichoke forms, as said, an excellent food for pigs, for which purpose, on the farm, it is best to run two or three furrows across the rows and turn in the pigs, and they will gather all they want. There will be quantities of small tubers left in the ground even after the pigs have been pastured on the field. Consequently, in the early spring, a bountiful crop of young plants will spring up. When these plants are a few inches high they should be ploughed out into rows 3 feet apart, and then thinned out to a stand of one plant to every 18 inches. In this manner the artichokes will form a next season's crop, and a good supply of pig food be obtained.

As compared with the potato, the Jerusalem artichoke yields about double the quantity of nutritive matter—in fact, its value as a food is equal to the cereal grains. Another advantage possessed by this vegetable is that it is more easily digested and not so liable to cause flatulency as the potato, and consequently may be safely eaten by delicate persons.

The "Journal of the Board of Agriculture," London (April, 1918), gives the composition of artichokes and potatoes as follows:—

			Water.		Proteins.		Total Carbohydrates.		Calories per lb.
Artichokes	..	..	79.	..	2.6	..	16.7	..	365
Potatoes	..	..	75.5	..	1.8	..	14.7	..	310

On rich garden soil the artichoke will yield as much as 20 tons per acre, and an average yield from field cultivation is about 10 to 12 tons.

PROSPECTS OF THE PEANUT INDUSTRY.

We have frequently advised the extensive planting of this crop, which goes indifferently by the name of peanut, earth nut, and ground nut. One reason why peanuts should be grown is, that there is an unlimited demand for oil seeds, amongst which the peanut ranks high; in fact, so excellent is the oil extracted from these nuts that it is said to be sold as pure lucca, or salad oil, made from olives. Another reason is, that heavy crops can be obtained without the use of manure or of irrigation, on sandy soils which will produce scarcely any other payable crop. A third inducement to planting peanuts is, that very little cultivation is required after preparation of the land and keeping the young plants clear of weeds until the vines are overground. As in the case of the sweet potato, the peanut vines make excellent fodder for stock, being first turned into hay. Previous to the great war the selling price of the nuts averaged £18 per ton, and at that price, even a 2,000-lb. crop would prove infinitely more remunerative than maize, wheat, arrowroot, and many other crops. £18 per ton is a little over 2d. per lb. The present-day price in the English market is £32 per ton in the shell. In the Brisbane markets peanuts sell at from 3d. to 6d. per lb. retail, or from £37 to £56 per ton.

There is no fear of over-production. Before the war, France—or, rather, one single seaport of France (Marseilles)—imported from India and Africa nearly 200,000 tons of peanuts annually.

The nuts contain from 30 to 50 per cent. of oil, the best of which is, as we have said, used as a substitute for olive oil, and the lower-grade oil is used to an enormous extent for manufacturing soap and for lubricating machinery. Peanut meal, which

is the residue after the oil has been extracted, is a foodstuff of high value, and ranks far above cotton-seed meal, which is one of the most richly concentrated meals found on the market to-day. The nuts, both raw and roasted, are largely eaten by all classes of people.

SOIL AND CLIMATE.

The peanut prefers a rather sandy, loamy soil, which should contain enough vegetable matter to make it light and porous, but it can be profitably grown on a very wide range of soils, provided they contain a sufficient amount of lime.

Since the trade demands a light-coloured shell, nuts of equal flavour and quality grown on dark-coloured soils do not find a ready sale. There is an abundance of good peanut soil in Queensland.

The peanut will thrive under a great variety of climatic conditions, provided there is a season of at least five months free from frosts. It has been thought by some that the peanut only grows well in a warm climate, but this is a mistake, since the nuts develop chiefly during the cool weather in the late summer and early autumn. Weather conditions most favourable to maximum production are an early spring, warm, even summer temperature, with a well-distributed rainfall, and a comparatively dry autumn. Of course, climate has an influence on the character and composition of the nuts, since it has been demonstrated that in tropical countries a larger percentage of oil is obtained. As to any other influences which climate may exert but little is known.

FERTILISERS.

Since the peanut is adapted for growth on a soil which is not naturally rich in any of the essential elements of plant food, the proper fertilisation of the crop becomes a matter of the utmost importance. It has been found that 60 bushels of nuts with a ton of hay will remove from the soil about 85 lb. of nitrogen, 15 lb. of phosphoric acid, 32 lb. of potash, and 47 lb. of lime. Of this amount, about 41 lb. of nitrogen, 6 lb. of phosphoric acid, 20 lb. of potash, and 42 lb. of lime were found in the hay; and since the vines would either be left on the ground or fed to stock, and the resulting manure applied to the land, the peanut is seen to be a comparatively easy crop on the land as far as soil exhaustion is concerned. It must be remembered that the plant derives a large percentage of its nitrogen from the air. The needs of a crop of peanuts may be supplied by 1,300 lb. of acid phosphate, 300 lb. of dried blood, and 400 lb. of muriate of potash. This mixture would contain about 2 per cent. of nitrogen, 10.4 per cent. of phosphoric acid, and 10 per cent. of potash. This should be used at the rate of 300 to 500 lb. per acre. Cotton-seed meal may be used to supply the nitrogen, and kainit the potash, although larger amounts of these per acre would have to be supplied.

Farmyard manure may be used to advantage, and will increase the vigour of the plant. Lime may be employed where wanting in the soil, in various forms, 20 to 30 bushels per acre being sufficient.

CULTIVATION.

The cultivation of the peanut is a very simple matter. The seed-bed should be finely pulverised to a depth of at least 5 in., then harrowed and rolled to obtain a level surface. Only well-developed and perfectly matured seed should be planted. About 2 bushels of seed in the pod should be allowed for each acre of land. Planting may be done at any time after danger of killing by frost is past. The seed is usually sown in drills 3 to 3½ ft. apart, and the kernels are placed from 15 to 18 in. apart in the drills. The land must be kept thoroughly clear of weeds, and this must be done early in the season, since the runners must not be disturbed after they form and spread.

HARVESTING.

Peanuts must be harvested before frosts occur, as frost injures both the vines and the kernels. The crop is generally harvested by means of a plough without a mouldboard, and which has a swordlike cutting share attached to the side. The knife passes under the row without injuring the nuts, and cuts the roots. Men following behind the plough with pitchforks, shake the nuts free from the soil,

and pile them in windrows. Other labourers follow and stack them around poles 7 ft. high, which are set at convenient places in the field. Care is taken to see that the vines do not come in contact with the soil, and the nuts are placed on the outside of the stacks. After the stack has been completed it is carefully covered with straw or grass as a roofing to keep off the water during rainy weather. After curing in these stacks for twenty days or more, the peanuts are ready to be picked. This is slow and tedious work, and one of the greatest expenses of the peanut-grower. After the nuts are picked, they should be cleaned before being packed in sacks, which hold about 100 lb. each.

VARIETIES.

There is a number of varieties of peanuts, all of which are cultivated extensively. Of these, the Virginia "bunch" and "running" are two of the most popular and widely known in the trade. In Australia, we have only two varieties—the ordinary little dwarf, mostly grown by Chinese gardeners, and the "Giant." The latter develop into magnificent plants, with deep tap-roots and widely spreading stems. They yield, on an average, about 100 good pods per acre. As fifty "Giants" go to make 1 lb., this is equivalent to 2 lb. per plant, or considerably over 4 tons (8,960 lb.) to the acre. But it would not be wise to reckon always on such yields, 2 tons being nearer the average crop. Even at that rate, peanut-growing pays better than horseracing (when you win at the latter game, which is seldom the case), whilst in gardening you are always on the winning side. At current market prices, an acre of peanuts may run fairly up to the three figures, whilst, at the price paid for seeds, one may reckon by hundreds.

In a paper on the peanut in the "Agricultural Gazette of New South Wales," 2nd July, 1918, by W. D. Kerle, Experimentalist, Hawkesbury Agricultural College, much valuable information on this crop is given, and is thus summarised:—

1. There are large areas of suitable land in the State.
2. The climatic conditions are favourable.
3. There is an extensive market for nuts of good quality for roasting and confectionery.
4. There are large quantities of edible and crude peanut oil imported annually, which could be produced locally.
5. The leading importers are prepared to use locally-grown nuts if the quality is equal to the imported article.
6. The protection afforded by the import duties of 2d. per lb. on nuts and 2s. 6d. per gallon on edible oil, with the possibility of increased duty when the area of production warrants it.
7. Excellent machines for handling in all stages of the industry are procurable from overseas.
8. The uses to which the peanut is put are ever increasing, and the demand is greater each year.
9. It is of considerable value on the farm holding as a soil-renovating crop and a quick-fattening fodder for all classes of stock.

This being so, how is it that so few of our farmers and others go in for this crop? We feel sure that, if the peanut were better known, there would not be a single farm, station, school, or cottage garden without its large or small crop of peanuts, which would supply both man and beast with that proportion of healthy vegetable fat which should never be wanting in a healthy and well-balanced diet.

GRAIN AND GRASS.

As an instance of the adoption of new methods that might be called revolutionary, we draw attention to the fact that England is growing wheat and oats on grass *without ploughing*. The seed and fertiliser are drilled in by a special tool on the end of the drills. This, as described by the *London Times*, is done

in July, and the growing crop is pastured off that autumn. The next spring the grain and grass are harvested together, the grain heads being cut by a "header," while the grass and grain straw are cut by another knife on the same machine. The claim is made that a sturdy growth of grain results, and that the grass sod is not injured. The aim is to prevent the ploughing up of all the permanent English pastures, owing to the need for growing more grain for war-feeding purposes. It is claimed that no injury is done to the grass sod—which would be sacrilege in England—while the sod serves to protect the grass from freezing or drought damage. Expense of ploughing is avoided, and the land is kept available for cattle pasturing. The war is causing us to use our wits, to devise new methods, to turn over old ones to see whether they are as sound as we thought.—“Farm Bulletin.”

MARKET FOR LINSEED.

In our September issue, it was stated that Messrs. Meggitt, Limited, linseed oil and meal manufacturers, Sydney, guarantee growers of linseed a market for at least 10,000 tons annually. We have now been informed by the firm that their requirements approximate not less than 24,000 tons per annum. We refer our readers to the article on “Linseed and Flax Growing” in the Journal for September, for full instruction as to the cultivation, harvesting, threshing, and marketing of this valuable crop.

A THRIVING FARM HOMESTEAD IN THE GLADSTONE DISTRICT.

We are indebted to Mr. G. Carter, M.L.A., member for Port Curtis, for the following notes on farm settlement in the Boyne Valley, which will give some idea of what may be done by an energetic man on the land in this fertile district:—

The accompanying photos are taken from the farm of Mr. Nicholas Hellen, Boyne Valley, Gladstone district, and will serve to illustrate the



fertility and suitability of this extensive valley for closer settlement. The best of this well-watered and rich area is at present held under pastoral leases that will shortly expire, and the whole or greater portion,



1 and 2.—A crop (this year) of 52 acres of potatoes, which averaged about 5 tons to the acre, and were of excellent quality.

I understand, will then be made available by the Lands Department for agricultural and grazing farms. There will be room for a large number of settlers, and as the land is well adapted for both general, dairying,



3.—An area of about 50 acres of maize, which returned a very heavy yield of first-class quality.



4.—Photo. of Mr. Hellen driving his own motor-plough.



5.—The barn, erected prior to the war, at a cost of £1,000.

and fruit farming, it should make an excellent settlement for returned soldiers.

Mr. Hellen's farm is about 40 miles by rail from the North Coast Trunk Railway Line, and about 45 miles from the magnificent deep-water port of Gladstone.



6.—The kitchen.

The photos give a good representation of the salient features of the farm.

THE COTTON INDUSTRY.

Cotton-seed may still be sown during this month, and in late Southern districts in November. As stated in the Departmental Announcements in another part of this issue of the Journal, the Department of Agriculture continues to make a free distribution of first-class Upland cotton-seed to intending growers, and during 1919, when early application for seed should be made, intending growers stating at the same time the area which it is intended to devote to this crop. The Department undertakes to advance 2d. per lb. on all cotton delivered at the ginnery in William street, Brisbane, when it will be ginned and marketed on owners' account, and any surplus, after sale, will be paid to the growers *pro rata*, after deduction of charges. Consignments are to be forwarded addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane, who should be advised of the despatch. Ten pounds of seed will be supplied per acre, to provide for replants or other contingencies.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.3	5.34	5.29	5.47	4.59	6.5	4.46	6.28	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania. H. M. 5 Sept. ● New Moon 8 44 p.m.
2	6.2	5.34	5.27	5.47	4.58	6.5	4.46	6.28	
3	6.1	5.35	5.26	5.48	4.57	6.6	4.46	6.29	
4	6.0	5.35	5.25	5.48	4.56	6.7	4.46	6.30	14 „ ☾ First Quarter 1 3 a.m.
5	5.59	5.36	5.24	5.49	4.55	6.8	4.46	6.31	20 „ ○ Full Moon 11 1 p.m.
6	5.58	5.36	5.22	5.50	4.54	6.9	4.46	6.32	27 „ ☾ Last Quarter 2 39 p.m.
7	5.57	5.36	5.21	5.50	4.54	6.9	4.46	6.32	The Moon will be farthest from the earth on the 8th, and nearest to it on the 21st.
8	5.56	5.37	5.20	5.51	4.53	6.10	4.46	6.33	
9	5.54	5.37	5.19	5.51	4.53	6.10	4.46	6.34	
10	5.53	5.38	5.18	5.52	4.52	6.11	4.47	6.35	5 Oct. ● New Moon 1 5 p.m.
11	5.52	5.38	5.17	5.52	4.52	6.12	4.47	6.35	13 „ ☾ First Quarter 3 0 p.m.
12	5.51	5.39	5.16	5.52	4.51	6.13	4.47	6.36	20 „ ○ Full Moon 7 35 a.m.
13	5.50	5.39	5.16	5.53	4.51	6.13	4.48	6.36	27 „ ☾ Last Quarter 3 35 a.m.
14	5.49	5.40	5.15	5.53	4.50	6.14	4.48	6.37	The Moon will be farthest from the earth on the 6th, and nearest to it on the 20th.
15	5.47	5.40	5.15	5.53	4.50	6.15	4.49	6.37	
16	5.46	5.41	5.14	5.54	4.49	6.16	4.49	6.38	
17	5.45	5.41	5.13	5.54	4.49	6.17	4.50	6.38	4 Nov. ● New Moon 7 2 a.m.
18	5.44	5.41	5.12	5.55	4.48	6.17	4.50	6.39	12 „ ☾ First Quarter 2 46 a.m.
19	5.43	5.42	5.11	5.55	4.48	6.18	4.50	6.39	18 „ ○ Full Moon 5 33 p.m.
20	5.42	5.42	5.10	5.56	4.48	6.19	4.51	6.40	25 „ ☾ Last Quarter 8 25 p.m.
21	5.41	5.43	5.9	5.56	4.48	6.20	4.51	6.40	The Moon will be farthest from the earth on the 2nd and 29th, and nearest on the 17th.
22	5.40	5.43	5.8	5.57	4.47	6.21	4.52	6.41	
23	5.39	5.44	5.7	5.58	4.47	6.21	4.52	6.41	
24	5.37	5.44	5.7	5.58	4.47	6.22	4.53	6.42	4 Dec. ● New Moon 1 19 a.m.
25	5.36	5.44	5.6	5.59	4.47	6.23	4.54	6.42	11 „ ☾ First Quarter 12 31 p.m.
26	5.35	5.45	5.5	5.59	4.46	6.24	4.54	6.43	18 „ ○ Full Moon 5 18 a.m.
27	5.33	5.45	5.4	6.0	4.46	6.25	4.55	6.43	25 „ ☾ Last Quarter 4 31 p.m.
28	5.32	5.46	5.3	6.1	4.46	6.25	4.55	6.44	The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th. There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.
29	5.31	5.46	5.2	6.2	4.46	6.26	4.56	6.44	
30	5.30	5.46	5.1	6.3	4.46	6.27	4.56	6.45	
31	...	...	5.0	6.4	...	...	4.57	6.45	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during September, October, and November may be roughly arrived at by adding 16 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Book Societies is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.

DAIRY BREEDS—*continued.*

GUERNSEYS.

Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia
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HOLSTEINS.

Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman	.. "St. Athan," Wyreema	12	47	Do.
F. G. C. Gratton	.. "Fowlerton," Kingsthorpe	1	15	Do.
R. S. Alexander	.. Glenlomon Farm, Coolumboola	1	3	Do.
Ditto	.. .. Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings	.. St. Gwithian, Toolooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff	.. Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.
E. Swayne	.. .. West Plane Creek, Mackay	1	2	Do.

ILLAWARRA.

A. Pickels	.. .. Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	.. .. Ramsay	2	22	Do.
Hunt Bros.	.. .. Springdale, Maleny..	3	62	Do.

MILKING SHORTHORNS.

P. Young	.. .. Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	.. .. Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	.. .. Torran's Vale, Lane-field	1	9	Do.
W. Middleton	.. .. Devon Court, Crow's Nest	3	27	Do.
A. K. Yorksten	.. .. "Dunure," Miles ..	2	8	Do.

BEEF BREEDS.

SHORTHORNS.

T. B. Murray-Prior	.. Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall	.. Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan	.. "Arubial," Condamine	3	6	Do.
W. B. Slade	.. .. E. Glengallan, Warwick	2	20	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued*.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS— <i>continued</i> .				
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

THE FRIESIAN CATTLE CLUB OF AUSTRALIA.

HOLSTEIN-FRIESIAN CATTLE.

At its annual meeting recently, the Friesian Cattle Club of Australia decided to reopen the Appendix of its Herd Book until 1st of April, 1919, for females showing not less than three-quarter pure blood, provided that they were approved by the Inspector on type, conformation, and colour. This step was taken in the interests of breeders in the Southern States who had not availed themselves of this appendix when it was opened two years ago.

Forms and full particulars on application to the Secretary, 303 Queen street, Brisbane.

PREPARATION OF WOOL CLIP FOR MARKET.—No. 1.

By R. WILSON, Assistant Instructor in Sheep and Wool.

CROSSBRED CLASSING.

Owing to late comment in the Press by the State Wool Committee and others in regard to the indifferent and faulty methods of preparing a wool clip for market I take the opportunity of giving some practical information on the subject.

Crossbreds were specially mentioned, as that class of sheep and wool are not so well known in Queensland as those of the merino, and in consequence do not receive the same careful handling. The classing of crossbred wool differs from merino classing, the latter being classed more by its general characteristics, while crossbred is classed according to the fibre.

In merinos we have first and second combings and clothings, classed mostly on account of their length, yield, and general appearance, whilst in crossbreds yield plays an unimportant part, as this description of wool does not vary in condition sufficiently to make two sorts of the one quality as in merinos, where one may be heavy and the other light.

The qualities of the merinos range from 60s. to 70s. for all practical purposes, while crossbreds have a wider range, from 36s. to 54s., and comebacks 56s. to 58s.

I mention the latter, as they are often found in a crossbred clip.

In the classing of the crossbreds *fibre* must be considered the main feature, other considerations taking next place.

I will take, for example, a clip of about 30,000, where the qualities would range from, say, 36s. to 54s., or 56s.

AAA (or fine) crossbred to contain all sound, lengthy-stapled fleeces of good colour and appearance and qualities, ranging from a good 48s. to 54s., having an average spinning value of about 50s. quality.

Where there are sufficient quantities of comeback wool to justify making a finer sort than your AAA, do so, and brand it "*super crossbred*."

AA (medium) crossbred to contain wool from 44s. to 46s. qualities, and any of the rougher 48s. that would suit the lower class better than the first.

All other features mentioned in the first line to be considered.

A (strong) crossbred to contain all qualities from 40s. and under.

The three lines, AAA, AA, and A will carry the bulk of the clip, but it may be necessary to make a line of the shorter-stapled fleeces or of a tender sort.

Short-stapled wool may be a little irregular in quality, but of short, blocky staples, and would suit the requirements of hosiery, the wool being short and spongy.

The irregularities in this line would be well compensated by the regularity of your leading lines as well as making a line suitable to the hosiery trade.

Rolling.—All fleeces should be rolled on the shoulders, showing the white skin side outward.

Skirting.—As clips differ so materially, the question must be left to the grower or expert employed.

I would advise that, should the burr, seed, or discoloured patches be light, they should be taken off, but if they are spread over the fleece, then only the lightest skirting possible be taken off, including rough bitty pieces and fatty edges.

Skirtings should be carefully picked over and put into various grades, as follows:—

1st Pieces crossbred should consist of all the biggest and lightest pieces.

2nd Pieces crossbred much the same as in merino. In a clip where skirtings are inclined to be heavy, sorting should be done well, and if practicable, all the britch pieces taken out, packed separately, and branded A pieces.

The reason for doing this is on account of the britch wool being so much rougher in quality than the wool from the sides, shoulders and neck, thus making two even lines of two distinct qualities.

Bellies, stain, and locks to be treated as in the case of the merino.

Small numbers of crossbreds should not be as finely classed. Any number from 10,000 sheep and upward could be treated on about the same lines as a clip of 40,000.

In clips numbering less than 10,000, which are more common in Queensland, the bulk of the fleece should be worked into two lines with, if necessary, a cast sort. The two bulk lines should be kept as even as possible, which would necessitate the cast sort being uneven.

As crossbreds cut a larger fleece and take up more space in a bale than merino, more can be done with them when in small numbers.

Where there are only a few crossbreds in a merino clip, it is always best to roll them unskirted and pack separately.

Should you have sufficient to make a bulk line, skirt lightly and pack pieces, bellies, &c., separately.

Classing of all wools, whether merino or crossbred, depends entirely on the bulk we are working from, and it is useless to try and force a sort when the clip you are handling does not contain it.

So when handling a clip of crossbreds where the finest quality is a 46s., gauge your sort accordingly, and do not think you must get a fine 50s. crossbred from every crossbred clip, but make it according to the quality that predominates.

[TO BE CONTINUED.]

A PRACTICAL SCHEME FOR THE ERADICATION OF THE RABBIT PEST.

By L. G. JONES.

The following suggestions for the elimination of the rabbit pest in Queensland by the writer, who has had considerable experience in rabbit-infested country in Tasmania, are well worth the attention of grazing farmers and others located in country where rabbits are numerous. Mr. Jones writes:—

We know that all schemes up to the present for the destruction of rabbits have been proved to be failures, more or less. When a station is grossly infested with rabbits, and the owner lays poison, a small percentage will be picked up dead, and the run will appear fairly clean; and at first sight, particularly if a man is of a sanguine nature, he will fool himself into the belief that they have all died in their burrows, hollow logs, &c., and conclude that he has done good work. Not so. Bunny is a very cunning animal. When a rabbit becomes poisoned, he squeals and shows other signs of distress, which alarms those not poisoned, and they drive into the next paddock; and if the laying of poison has been general over the whole station they drive on to the neighbouring stations. Then, after awhile, if the neighbours lay poison they drive back again. This is a fact, as anybody that has had experience in this matter will confirm. Likewise with destruction by trapping. All experienced rabbit-trappers know that in the early part of the rabbit season or when a trapper first sets his traps at a warren there is no need for him to shift his traps for two or three days, but as the season progresses it calls for a good deal of skill on the part of the trapper to make good catches, when he will need to shift his traps every day and often long distances if he desires to make good catches, and at the end of the season the run appears to be very clean. Very few rabbits are seen aboveground. The number of skins sold prove conclusively that the apparent scarcity is not due to the numbers that have been caught. No; they get cunning and avoid the traps and drive away from the locality where the traps are, and often stay underground for long periods during the hunting season. The same remarks apply to all other forms of rabbit destruction—hunting, shooting, ferreting, &c.

A general conception of how to cope with this pest will be as follows:—

Firstly, the Government should make a monopoly of all rabbit, hare, and marsupial skins, and make it illegal for any person or persons to traffic in them. All skins would then go through their hands, and they (the Government) should hold these skins and sell them at such a price as will defray the cost of catching them.

Secondly, the Government should then set the price of rabbit-skins, say, at 6s. per dozen (large and small), leaving no incentive for people to farm them. This

would have the effect of starting thousands of people catching rabbits in their spare time, Saturdays and Sundays, and thousands of others would be after them exclusive of any other work, because it would pay them so to do.

Thirdly, as it was judged that the rabbits in a district were getting scarce I would raise the price of the skin. This would not be adding expense to the scheme, because you would be buying a less number of skins. And as the rabbits got still more scarce I would raise the price again and again (always keeping up the incentive to kill) until I brought them within the power of their natural enemies, when I would expect them to complete the job.

This scheme would work itself out, without any expensive staff. Naturally if you make a thing worth having people will go after it, and the destruction of rabbits would become general. Follow this principle as far as it takes you and you will soon see the rabbit pest a thing of the past.

DEHORNING WITH SAW OR CLIPPERS.

After the horns of calves have reached a certain size it becomes necessary to cut them off. Saws and clippers are the two common instruments used for this purpose. The clippers are quicker and less painful to the animal, but the saw does not crush the horn as do the clippers, especially in the case of old animals whose horns have become hard and brittle. On the other hand, when the saw is used there is not so much bleeding, as the action of the saw causes the blood vessels to be lacerated, and a clot of blood forms quickly.

Clippers give very good results with young cattle, but with old animals the saw should be used, as the crushing of the hard bone in an older animal causes the bone to splinter, which makes a wound that heals very slowly. The loss of blood from older animals will also be more likely to cause trouble than with younger animals. Although some stockmen prefer using the clippers altogether, it is much safer to use the saw altogether than it is to use the clippers altogether. A desirable compromise would be to use the saw on the hard, brittle horns of the older animals and the clippers on the soft, tender horns of the younger animals.

Whichever instrument is used, care should be taken to cut enough of the horn to insure that unsightly stubs will not grow out. From one-eighth to one-half inch of skin should be taken off to insure this. When this is done the horn-forming cells are probably destroyed, which prevents further growth of horns. If none of the skin is taken off the stubs of horns will grow out and sometimes are almost as effective in hooking as the original horn. Occasionally, too, such a stub will grow down into the eye of the animal, which makes it necessary to perform the operation again.

TREATMENT AFTER DEHORNING.

Cattle should never be dehorned during warm weather—that is, weather that is warm enough to cause danger of the wound becoming infested with screw worms. If there is any danger of flies whatever, some fly-repellant should be applied to the wound immediately after the animal is dehorned. Either coal tar or pine tar is very satisfactory. Both are non-irritating and adhere well to the skin and the wound. Whichever of these is used, if too thick to apply conveniently, may be thinned with fish oil or linseed oil. Either an ordinary paintbrush or a swab made by tying a rag on a stick may be used to apply the tar.

The practice of placing a piece of cotton outing flannel over the wound made by dehorning, as advocated by some stockmen, usually meets with poor results, except possibly when the cattle are to be turned into fields where they will be exposed to burrs or to severe winds. In such cases the cloth protects the wound to some extent. Ordinarily, it requires too much time and trouble, and not 50 per cent. of the cloths will stick after they are put on. The practice of using a hot iron to sear the wound and stop the bleeding is not practicable, nor is it necessary.

If in spite of all precautions the wound becomes infested with screw worms they may be removed by saturating a piece of absorbent cotton with chloroform and inserting it into the wound, or by pouring gasoline into the horn cavities. The chloroform or gasoline will kill the screw worms, after which they may be removed with a pair of forceps, a probe, or by forcing the animal's head to one side and allowing them to drop out. Carbolic acid or some other efficient disinfectant may be used for killing the worms, but these are not so effective as chloroform or gasoline. If the carbolic acid solution is used, add three tablespoonfuls of the acid to a quart of water. A stronger solution than this is liable to injure the skin or the tender tissue of the wound. This solution can be applied with a syringe or by using a brush or a swab.

After the worms have been removed, either pure pine tar or one of the coal-tar disinfectants in proper dilution may be applied.—“Pastoral Review.”

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FROM 31ST JULY TO 31ST AUGUST, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Auntie's Lass ...	Ayrshire ...	3 Aug., 1918	1,211	3.5	50.60	
Lady Melba ...	Holstein ...	31 Mar. „	971	3.2	36.22	
Miss Betty ...	Jersey ...	9 June „	542	4.7	30.01	
Rosalie II. ...	Ayrshire ...	2 July „	503	5.0	29.68	
Magnet's Leda ...	Jersey ...	20 June „	538	4.6	29.15	
Skylark ...	Ayrshire ...	25 July „	643	4.4	28.29	
Buttercup ...	Shorthorn ...	30 May „	730	3.2	27.25	
Charming Damsel ...	Ayrshire ...	1 May „	526	4.4	27.24	
La Hurette Hope ...	Jersey ...	10 July „	501	4.6	27.15	
Miss Security ...	Ayrshire ...	19 July „	632	3.5	25.86	
Sylvia II. ...	Shorthorn ...	14 July „	678	3.2	25.36	
Nina ...	„ ...	19 July „	674	3.2	25.02	
College Bluebell ...	Jersey ...	18 July „	602	3.0	24.87	
College Damsel ...	Holstein ...	4 Aug. „	739	2.8	24.33	
Lady Margaret ...	Ayrshire ...	27 Dec., 1917	448	4.6	24.27	
Leda's Jessie ...	Jersey ...	25 Mar., 1918	383	5.3	23.88	
Yarraview Ida's Hope	Guernsey ..	5 May „	491	4.8	23.29	
Miss Edith ...	Jersey ...	23 Dec., 1917	265	6.2	23.09	
Dawn of Warragaburra	„ ...	4 May, 1918	424	4.6	22.98	
Lady Peggy ...	Ayrshire ...	30 Mar. „	569	3.4	22.63	
Lady Loch II. ...	„ ...	13 June „	533	4.6	22.44	
Snowflake ...	Shorthorn ...	28 June „	530	3.4	22.06	
Mistress Bee ...	Jersey ...	23 Jan. „	311	5.9	21.72	

NOTE ON THE JUICE OF THE CHOKO.

The following note on the juice of the choko vegetable was sent to the Government Botanist of New South Wales, Mr. J. H. Maiden, and was published in the July issue of the "Agricultural Gazette of New South Wales":—

The writer, Mr. E. W. Smith, of Bexley, said—"A few weeks ago, my wife informed me that when she was peeling a choko, her hands became numb, and she thought they were becoming paralysed. A fortnight later the same thing happened under similar circumstances, and I came to the conclusion that the juice of this vegetable must have local anæsthetic properties. I have since had this opinion confirmed from questions I put to another lady whose experience was the same. I feel sure that the concentrated juice of this vegetable would prove a very powerful and valuable local anæsthetic." Mr. Maiden stated that, on speaking to a member of his household on the subject, she at once replied that the peeling of chokos makes her hands cold and rough, and therefore she always uses a fork in order that she may touch them as little as possible.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, AUGUST, 1918.

All pens, with the exception of one or two odd cases, are now in full lay. Broodiness has not been so prevalent as during the corresponding month last year. The following competitors have had broodies:—Mee (4), Feilly (3), W. Smith (2), Lutz (1), Fitzpatrick (1), Claussen (1), and Puff (1). Three deaths have occurred, viz.:—Zahl (2) and W. Reilly (1). Five cases of sickness have been treated. Some fine laying has been done by the heavy breeds during the month. D. Fulton's "A" bird has laid for forty-three consecutive days, and "C" for forty-one days. The "A" bird missed only three days from 5th June. The weather on the whole has been good, though some cold nights have been experienced, on some of which the thermometer registered 4 degrees below freezing point. During the month the eggs were weighed, with the results shown in table below. In carry out this weighing each individual egg was weighed, and, though complete details cannot be given, one very interesting point stood out in the case of the pullets which are being single tested. Thus it was found that in some cases the pullet laid consecutive eggs of almost identical weight. For example: G. W. Hindes's "D" bird laid five consecutive eggs of 2 oz. each, and throughout Mr. Hindes's hens showed little individual variation. In other cases, hens laid on consecutive days eggs of very varying weights (double-yolked eggs were not considered): thus, Mrs. A. T. Coomber's "B" bird laid eggs weighing $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$, $1\frac{3}{4}$, and $1\frac{3}{4}$ oz. As a matter of analysis, 25 birds showed no variation, 139 a variation of $\frac{1}{8}$ oz., 56 a variation of $\frac{1}{4}$ oz., 5 a variation of $\frac{3}{8}$ oz., 4 a variation of $\frac{1}{2}$ oz., and 1 a variation of $\frac{5}{8}$ oz. Thus it would seem that uniformity of eggs is a character which may be bred in our pullets. From the table of weights it will be seen that there are a fair number of birds amongst the light breeds below standard, but amongst the heavy breeds the condition is deplorable, only 5 out of the 18 competing groups yielding eggs up to requirements, while 47 out of the 66 single tested birds are ineligible for prizes. One other point is worthy of notice. The pen of the Dixie Egg Plant, which put up the very fine record of 579 eggs up till the 31st July, yielded another nine eggs by 2nd August. Thus their total for the four full months of winter laying (the College competition started on 3rd April) is 588 eggs, a world's record for numbers. This

is unfortunately largely discounted, inasmuch as every one of the six birds concerned lays an egg below the standard of 24 oz. to the dozen. The following are the individual records:—

Competitors.	Breed.	August.	Total.
LIGHT BREEDS.			
*Dixie Egg Plant	White Leghorns ...	144	723
*G. W. Hindes	Do.	137	633
*E. Chester	Do.	145	631
*G. Howard	Do.	143	620
C. P. Buchanan	Do.	136	610
*C. Knoblauch	Do.	133	609
*G. Prince	Do.	140	601
*T. Fanning	Do.	131	596
*G. H. Turner	Do.	137	580
*W. Becker	Do.	133	580
*Mrs. L. Henderson	Do.	118	576
*R. Holmes	Do.	137	567
*W. Lyell	Do.	134	566
*L. G. Innes	Do.	135	546
*O. K. Yards	Do.	119	546
*Oakland Poultry Farm	Do.	132	541
*E. A. Smith	Do.	133	540
B. Caswell	Do.	122	529
*Dr. E. C. Jennings	Do.	125	514
H. Fraser	Do.	111	506
*Range Poultry Farm	Do.	115	501
J. J. Davies	Do.	117	498
*T. Taylor	Do.	115	496
*Quinn's Post Poultry Farm	Do.	134	495
*Chris. Porter	Do.	122	494
O. W. J. Whitman	Do.	108	489
*Mrs. A. T. Coomber	Do.	128	471
*J. Zahl	Do.	118	471
R. T. G. Carey	Do.	110	462
*J. M. Manson	Do.	130	440
*Homalayan Poultry Farm	Do.	124	430
G. Williams	Do.	80	426
Mrs. L. F. Anderson	Do.	128	413
S. Wilkinson	Do.	91	408
*T. B. Hawkins	Do.	122	407
Mrs. A. G. Kurth	Do.	114	380
G. Trapp	Do.	106	378
*Mrs. R. Hunter	Do.	121	377
Shaw and Stevenson	Black Leghorns ...	118	377
*J. W. Newton	White Leghorns ...	115	376
H. B. Stephens	Do.	108	372
H. F. Britten	Do.	104	368
Progressive Poultry Pens	Do.	88	347
B. Chester	Do.	120	337
P. C. Oldham	Do.	112	316
W. A. Wilson	Do.	96	295
A. W. Walker	Do.	114	274

HEAVY BREEDS.

*Nobby Poultry Farm	Black Orpingtons ...	138	668
*E. F. Dennis	Do.	144	550
*E. Morris	Do.	141	549
*A. E. Walters	Do.	157	547
T. Hindley	Do.	123	544
*Mars Poultry Farm	Do.	136	497

EGG-LAYING COMPETITION—*continued.*

Competitors.					Breed.	August.	Total.
HEAVY BREEDS— <i>continued.</i>							
*W. Smith	...	...	...	...	Black Orpingtons	124	497
*R. Burns	...	...	...	...	Do.	146	491
*W. H. Reilly	...	...	...	...	Chinese Langshans	117	491
*J. W. Macrae	...	...	...	...	Black Orpingtons	119	484
E. M. Larsen	...	...	...	...	Do.	105	482
*D. Fulton	...	...	...	...	Do.	164	474
A. Shanks	...	...	...	...	Do.	138	420
W. J. Mee	...	...	...	...	Do.	98	396
T. W. Lutze	...	...	...	...	Do.	132	364
*F. A. Claussen	...	...	...	...	Rhode Island Reds	124	363
H. Puff	...	...	...	...	Do.	90	308
J. Fitzpatrick	...	...	...	...	Do.	124	266
Totals	...	...	...	...	...	8,023	31,103

* Indicates that the pen is engaged in the single hen test.

RESULTS OF SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	116	117	130	112	121	127	723
G. W. Hinds	131	107	104	105	100	86	633
E. Chester	105	112	97	123	96	98	631
G. Howard	96	104	110	102	98	110	620
C. P. Buchanan	99	95	107	96	110	103	610
C. Knoblauch	99	92	115	98	104	101	609
Geo. Prince	73	111	109	106	97	105	601
T. Fanning	110	98	108	71	106	103	596
W. Becker	96	97	79	112	89	107	580
G. H. Turner	54	77	108	109	127	105	580
Mrs. L. Henderson	101	86	97	64	112	116	576
R. Holmes	110	102	89	88	80	98	567
W. Lyell	99	102	102	92	84	87	566
O.K. Poultry Yards	83	102	104	83	100	74	546
L. G. Innes	94	114	122	60	57	99	546
Oakland Poultry Farm	78	90	102	103	85	83	541
E. A. Smith	70	107	96	106	95	66	540
Dr. E. C. Jennings	73	109	97	83	90	62	514
Range Poultry Farm	33	115	62	89	95	107	501
Thos. Taylor	54	96	92	74	85	95	496
Quinn's Post Poultry Farm	111	66	80	69	104	65	495
C. Porter	49	91	96	71	88	99	494
J. Zahl	100	76	90	88	67	50	471
Mrs. Coomber	52	96	75	81	55	102	471
J. M. Manson	104	95	106	49	35	51	440
Homalayan Poultry Farm	93	79	60	52	92	54	430
T. B. Hawkins	83	67	94	46	64	53	407
Mrs. R. Hunter	61	93	11	60	69	83	377
J. W. Newton	72	101	27	49	72	55	376
HEAVY BREEDS.							
Nobby Poultry Farm	125	108	100	100	114	121	668
E. F. Dennis	116	93	85	41	123	92	550
E. Morris	77	91	111	109	94	67	549

DETAILS OF SINGLE HEN TESTS—*continued*.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS— <i>continued</i> .							
A. E. Walters	90	115	69	99	113	61	547
W. Smith	125	91	28	82	75	96	497
Mars Poultry Farm	83	96	85	83	77	73	497
W. H. Reilly	87	111	89	34	75	95	491
R. Burns	73	82	64	70	108	94	491
J. W. Macrae	48	50	107	78	98	103	484
D. Fulton	88	84	69	65	39	129	474
F. A. Claussen	71	68	46	71	76	31	363

WEIGHTS OF EGGS, SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Group.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
LIGHT BREEDS.							
G. W. Hindes	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2	2	2 $\frac{1}{4}$	2
O. K. P. Farm	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2	2
Range P. Farm .. ..	..	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2
L. G. Innes	2	2	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$	2 $\frac{1}{2}$
Geo. Prince	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	1 $\frac{3}{4}$	1 $\frac{9}{16}$
C. Knoblauch	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{4}$	1 $\frac{7}{8}$	2	2
Oakland P. Farm	2 $\frac{1}{4}$	2	2	1 $\frac{3}{4}$	2	2 $\frac{1}{8}$	2
E. A. Smith	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2
G. Howard.. ..	2	2	2 $\frac{1}{4}$	2	2 $\frac{1}{8}$	2	2 $\frac{1}{2}$
T. Fanning	2	..	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2	2 $\frac{1}{4}$	2
R. Holmes.. ..	2 $\frac{1}{8}$	2	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2
T. B. Hawkins	2	2 $\frac{3}{8}$	2	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{2}$
G. H. Turner	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	2
Mrs. Henderson	3	..	2 $\frac{1}{8}$	2	1 $\frac{7}{8}$	2 $\frac{1}{4}$	2
J. H. Wright	2	2	2 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{8}$	2	2 $\frac{1}{2}$
C. Porter	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2	2	2	2
C. P. Buchanan	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2
J. W. Newton	2 $\frac{1}{8}$	1 $\frac{7}{8}$	2	2	2 $\frac{1}{8}$	2 $\frac{3}{8}$	2 $\frac{1}{8}$
Dixie Egg Plant	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{4}$	1 $\frac{7}{8}$
J. Zahl	1 $\frac{7}{8}$	2	2	2 $\frac{1}{4}$	2	..	2
Mrs. R. Hunter	2	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2
W. Becker	2	2	2	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	2
E. Chester	1 $\frac{7}{8}$	1 $\frac{5}{8}$	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$
Quinn's Post R.F.	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$
Mrs. Coomber	2	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2	2	2	2
Thos. Taylor	2	2 $\frac{1}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{8}$	2	2
J. M. Manson	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	1 $\frac{7}{8}$	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$
Dr. Jennings	2 $\frac{1}{8}$	2	2	1 $\frac{7}{8}$	2	2	2
W. Lyell	1 $\frac{7}{8}$	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$
HEAVY BREEDS.							
J. W. Macrae	2 $\frac{1}{4}$	2	2	2	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2
W. Smith	1 $\frac{7}{8}$	2 $\frac{1}{8}$	2	..	..	1 $\frac{3}{4}$	1 $\frac{7}{8}$
F. A. Claussen	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2	2 $\frac{1}{8}$	1 $\frac{5}{8}$	1 $\frac{5}{8}$
W. H. Reilly	1 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
E. F. Dennis	1 $\frac{5}{8}$	1	1 $\frac{5}{8}$	2	1 $\frac{5}{8}$	2	1 $\frac{3}{4}$
Mars P. Farm	1 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
A. E. Walters	1 $\frac{7}{8}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
E. Morris	2	2	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
R. Burns	2 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$	2	2	1 $\frac{7}{8}$	2
D. Fulton.. ..	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	2	1 $\frac{7}{8}$
Nobby P. Farm	1 $\frac{3}{4}$	1	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$

GROUP PENS.

						Average.	Variation.
LIGHT BREEDS.							
H. F. Britten	..	..	..	..	..	2 oz.	1 ³ / ₄ to 2 ¹ / ₈ oz.
G. Williams	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₄ "
A. W. Walker	..	..	..	..	..	2 ¹ / ₈ "	1 ⁷ / ₈ to 2 ¹ / ₄ "
Harold Fraser	..	..	..	..	..	1 ⁷ / ₈ "	1 ⁵ / ₈ to 2 "
W. A. Wilson	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₄ "
S. Wilkinson	..	..	..	..	..	1 ⁷ / ₈ "	1 ³ / ₄ to 2 "
Mrs. Anderson	..	..	..	..	..	1 ⁷ / ₈ "	1 ⁵ / ₈ to 2 ¹ / ₄ "
B. Chester	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₈ "
Geo. Trapp	..	..	..	..	..	2 "	1 ⁷ / ₈ to 2 ¹ / ₄ "
R. T. G. Carey	..	..	..	..	..	1 ³ / ₄ "	1 ¹ / ₂ to 2 ¹ / ₈ "
O. J. W. Whitman	..	..	..	..	..	1 ⁷ / ₈ "	1 ³ / ₄ to 2 ¹ / ₄ "
B. Caswell	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₄ "
P. Oldham	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₄ "
J. J. Davies	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₈ "
Shaw and Stevenson	..	..	..	..	..	2 "	1 ⁷ / ₈ to 2 ¹ / ₄ "
H. B. Stevens	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₄ "
Mrs. A. G. Kurth	..	..	..	..	..	2 ¹ / ₈ "	1 ⁷ / ₈ to 2 ³ / ₈ "
Progressive P. Pens	..	..	..	..	..	2 ¹ / ₈ "	2 to 2 ³ / ₈ "
HEAVY BREEDS.							
E. H. Larsen	..	..	..	..	..	1 ⁷ / ₈ oz.	1 ³ / ₄ to 2 "
J. Fitzpatrick	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ¹ / ₈ "
T. Hindley	..	..	..	..	..	1 ⁷ / ₈ "	1 ³ / ₄ to 2 "
H. Puff	..	..	..	..	..	2 "	1 ³ / ₄ to 2 ³ / ₈ "
W. J. Mee	..	..	..	..	..	1 ³ / ₄ "	*
A. Shanks	..	..	..	..	..	1 ³ / ₄ "	1 ⁵ / ₈ to 2 "
T. W. Lutze	..	..	..	..	..	1 ⁷ / ₈ "	1 ⁵ / ₈ to 2 ¹ / ₈ "

* Not sufficient eggs to secure fair average.

QUEENSLAND AGRICULTURAL COLLEGE.

POULTRY CONFERENCE.

The second annual conference of poultrymen was held at the Gatton Agricultural College on Wednesday, 21st August. The morning was spent in inspecting the fowl runs and competition birds, and in the afternoon the conference was held in the gymnasium hall. The Principal of the College (Mr. Cuthbert Potts, B.A.) presided, and supporting him on the platform were the Minister for Agriculture (Hon. W. Lennon) and the Under Secretary of the Department (Mr. E. G. E. Scriven).

Mr. Potts said that he was quite sure they would recognise how pleased he was to see before him such a splendid crowd of representative poultrymen, and to feel that the College was the centre of common interest to poultry fanciers. It was an appropriate place, he felt, at which to hold such a conference. Last year they made a commencement with the annual conferences, somewhat doubtful of what success would be attained, but he had now no doubt that the conference would continue for everlasting. He was pleased to know that they had with them the Minister for Agriculture, and he had much pleasure in introducing him to the conference. (Hear, hear.)

The Minister, who was given a very cordial reception, said that it afforded him considerable pleasure to be there that day. He wanted to remind them that that was the second conference of that nature at the College. The one last year was by way of an experiment, but he was glad to think that the holding of that had done a lot of good to the industry, and that it had acted as an incentive to people throughout the State to take an interest in poultry. That the interest had grown was shown by the fact that the attendance at that (the second) conference had grown to double that which they had last year. He had on the stocks at present a Bill which aimed at solving a somewhat difficult problem—a Bill to provide for the standardisation

of foods for poultry. (Hear, hear.) There were many patent foods on the market, more or less good, but the object of the Bill was to see that, by analysis, the people who bought those foods were getting something which they were buying and paying for; and that they were not buying rubbish. That was a rather difficult matter to solve. At a conference of Ministers of Agriculture, held in Sydney recently, this matter had been brought up by himself, in order to see if anything had been done in the other States in regard thereto. He hoped that Act, which was founded on some of the provisions of measures adopted in other States, would be an improvement on them. He was not free to divulge the nature of the Bill at that juncture. Proceeding, he said that he considered Queensland an ideal place for poultry-raising. They had, in the main, a long and not too oppressive summer, and a moderately short and not too severe a winter. Consequently poultry-raising would not be hampered by so many difficulties as were met with in other parts of the world. He regretted to say, however, that they had in Queensland only a fraction of a fowl to each person in the State. In America, with a population thirteen times as great as ours, they had three fowls to every person. In strong comparison with that was Japan, where they had only one fowl to every three persons. That would give them an idea of the great difference in these countries of the measure in which poultry-raising was gone in for, and would demonstrate the fact that America had shown great progress in the poultry industry. As a matter of fact, America stood to-day as unrivalled in the importance attaching to the industry, and in the profitable nature in which it was carried on. Queensland had yet a lot to learn in regard to the industry. They did not want to see people rushing blindly into an industry before seeing where they were going to end. Queensland was an ideal place for poultry-raising, and he hoped that the rising generation, and the present generation, would be seized with the necessity of going on and improving the industry, and in that connection he hoped they would be influenced by the fanciers already in the business. So that he might not display his ignorance too greatly, he intended to act on a suggestion from the Principal, and content himself with reading for them a few facts prepared for the purpose. "That was the second conference held at the College," continued Mr. Lennon, "and your deliberations should be of value to your industry and to the State. I understand that the majority of those present are breeders of poultry, and not in a true sense poultry farmers. I recognise the good work a keen breeder can do, even if he has taken the work up as a hobby, and is only operating in a small way. For, assisted by the various egg-laying competitions, the egg-producing capacity of poultry has shown a steady improvement during the last sixteen years, and it is a remarkably fine performance for Australia that two hens last year—one in Victoria and the other in Queensland—should have laid 335 eggs in 365 days. But perhaps the most important feature indicated by the competitions is that the average yield per hen has steadily improved. At the inception of Australian egg-laying competitions, it was the aim to obtain the 200-egg hen, but since then our aspirations have become greater, and there seems no reason why we should not get the 250-egg hen, or even the 300-egg hen. Careful breeding, then, has produced stock which are efficient and more economical producers. The results of the competitions, however, represent chiefly the success of the breeders. They do not fully reflect the average egg-laying capacity of the flocks of the State. Hence I regret that we have not here represented a greater proportion of poultry farmers—men who are entirely dependent on poultry-raising, and of those farmers who depend on poultry for part of their revenue. Most of you are probably dependent on the selling of settings of eggs and stud birds to cover your expenses and yield a profit. But I would impress on you that the success of the industry depends on the successful marketing of eggs and table poultry. In glancing through the agenda paper, I find several subjects for discussion in connection with the competition, but I do not find these broader issues raised. Yet your success as breeders must depend on the commercial utilisation of your well-bred stock. Eggs, as you are aware, varied in price from about 6d. per dozen to 2s. 5d. per dozen during the past year in the Brisbane market. Again, in the north and out in the western districts eggs have remained consistently high in price. Something should be done to stabilise the price of eggs in the big markets, either through cold storage, egg pulp, or dried eggs, while it would appear possible to develop the possible market for eggs in the north and west." The Minister added that he hoped that eventually accommodation would be made in the cold storage buildings, to be erected in Brisbane, for eggs. Proceeding, he said, "There is another section of the poultry work which remains to be developed—this is the table poultry. This year the College exhibited a very fine collection of cross-bred and pure-bred capons, cockerels, and hens at the Exhibition. It would seem that much could be done to develop the table poultry market for the purpose of absorbing the surplus cockerels of the year's hatch as capons. Whether an overseas trade can be developed later remains to be seen. Since you were here last year, considerable development has taken place at the College poultry farm. To supply poultry for repatriation purposes more equipment was required, and, as a result, you saw to-day

the breeding pens, incubator house, and brooders which have recently been erected. Further, to meet the demands of the competition, another 120 single pens have been completed this year. All these buildings have been placed on a new site, well chosen for aspect and drainage, and at present work is in progress transferring the old yards and houses to the new site. In this work an endeavour has been made to lay out the buildings on a model plan, and in this I trust we have been successful. He felt sure they all appreciated the work done by Mr. Potts in modernising the pens. They would see how he had placed them facing the rising sun—than which they had no better purifier. The pens seemed to him to be as perfect as it was possible to make them, and were in striking comparison to the old ones. On this improvement he thought the present Principal was to be congratulated. He thought also that the Government, and even the Minister, was to be congratulated on this state of affairs, because no matter how skilful, earnest, or expert the Principal might be, unless he had a sympathetic Minister and a sympathetic Government to make the money forthcoming, he could not do very much. He (Mr. Lennon) was only sorry that he could not do more to assist them. He would conclude by expressing the hope that they would not only enjoy themselves, but would benefit by the trip to the College, and that their deliberations would assist in developing and bringing forward much more rapidly the great poultry industry in this State of Queensland. (Loud applause.)

Mr. Potts said that since he had been in Queensland he had endeavoured to do a great deal, but he had never attempted to do anything without having the sympathy of the Minister. He called for cheers for Mr. Lennon, which were heartily given.

Mr. A. Harwood (Poultry Instructor) said he had been asked to speak upon the question of table poultry, but would preface his remarks with a few words on feeding, &c. He said he was often asked the question by competitors "How is it that my birds are not doing so well at the College as they are doing at home?" There were several reasons he could give for that. The first related to pens. The system adopted at the College was practically free range. Birds taken from intensive or semi-intensive pens would have a certain set-back when changed straight away when they came to the College. At first they had had ideal weather, which gave them a good chance to get quickly off, but when the westerlies came, those birds used to intensive penning stood no chance of keeping up with the birds which had had no coddling. The former birds, when encountering the westerlies, seemed to tuck up, and go off their food and break into adult moults. That was one of the worst troubles which they had. The question of feeding was another important item. The feeding method adopted was published in the annual report. On the commencement of the competition he did not give the birds a full percentage of blood. If he was to give them the full complement of blood at the commencement of the competition he would have trouble galore—mostly bowel troubles. He usually gave them a 3 per cent. ration, and gradually increased it. Putting those birds used to grain on to a concentrated food was going to upset them. He started on the small percentage and worked up. The type question was one which was going to cause a good deal of unrest amongst the competitors for two or three reasons. One was the question of utility birds, which he held must be standardised. If this were done, practically every pen of birds in the present competition would be passed through. They were endeavouring to improve the standard of the birds, and by adopting the present standard he did not think that they were doing any injustice. In connection with housing and feeding, if they all made a note of what he said about this, he thought they would have a better start for next year's competition. He went on to refer to the climatic conditions in Queensland for the raising of poultry, and said that he had reared poultry in the mountains of Derbyshire, in the south of England, and in Queensland, but give him Queensland every time. He thought of the long hours he spent here with the birds and the chickens, but in contrast to that he thought of the trouble and the overtime spent in the old country. There was, for instance, the vaselining of the combs—something which they did not have to contend with in this country. He had been in Australia eight years, and he thought he was now capable of forming an opinion of the lot of the breeders here and in England. In the poultry literature published in this country he noticed a lot of quibbling. This was a grave mistake, and was in distinct contrast to the course followed in America, where the poultry journals were full of interesting information. So long as they pulled against each other they would never come to a satisfactory basis. Here it seemed to be, that everyone considered he was above his neighbour, and made pretensions to know more about his business than his neighbour. That was the gravest mistake they ever made. Since he had come to Australia he had seen a tremendous leap forward made by the industry, but he hoped to see still greater strides. To do it they must all work together. If they did that, he was sure they would meet with success and get good results.

Proceeding to deal with the question of table poultry, he said that this branch of the industry was practically unknown here. He could not see any reason why table poultry should not eventually be of great commercial value to this State. Con-

trasting the way table poultry were sold here with that in Great Britain was enough to make one smile. Here the birds were sold so much per head, whilst in England the sale was by weight of the birds. Was the system of buying by what they could see, as followed here, fair to the man who paid great attention to his feeding? The breeder who bred the birds was worth considering. Should he not have more consideration than the person who only fattened? It was about time that they adopted the practice of selling by weight—so much per pound. When they did that, they were going to make a good start with this branch of the business. His home was on the Sussex border, where practically every farm was a fattening establishment. It was not their purpose to feed for muscle in this feeding process. The coops stood on legs about 3 feet from the ground, and in these, six birds were placed. The birds had no exercise whatever. To protect them from the wind, they placed 6-inch saplings about 7 feet out of the ground. Wire-netting was placed on either side of this, and litter of any kind was used as a breakwind. The “higgler” was a man who went round the district and collected the birds from the farmers. The price would vary considerably. Each higgler had his own customers. The cart he used was a flat-topped affair with no sides, with crates standing on top. It was not an uncommon sight to see a higgler’s cart going along with one or two hundred birds hanging out through the bars. The birds which were selected were those which had no pin feathers. They were kept in close confinement for over three weeks, during which time they naturally put on considerable weight; but the majority of the weight was put on during the last week. The feeding for the first ten days was trough feeding. No water was supplied to the birds, all the moisture being derived from the feed. No food was left in front of the birds; all they had to do was to browse and put on fat. Another essential was to be sure that the birds had no lice on them. It was no use whatever feeding a bird which had lice on it. Fatteners would reject these birds until they were clean. In the fattening process they had what they called a crammer—a “blow out” machine. To cram properly, it was necessary to get the pipe right down the bird’s neck. Without cramming they could not put on weight in the old country. The heat would perhaps be too oppressive to do that here. But the best form of feeding was to put the birds in an isolated place with plenty of feed and water. The question of dealing with the cockerel must engage their attention. In America these birds were turned into a rich commercial article. It seemed a wanton waste to him to follow the system in vogue here, of screwing their necks and feeding them to the other birds. He suggested that they should form a committee for the purpose of threshing out the table poultry question. If they went on with the present system one saw here, and sold the birds anyhow, the market would be a loss to everyone, and would be very discouraging to those engaged in the industry. They had to go on and not stop in the task. Wherever he could render any assistance in that forward movement he would be only too happy to do so. In connection with the marketing of the birds, the practice here seemed to be to scald the birds. Such a system in the old country would not be looked at, where the poultry were dry-plucked. He instanced the fact that at the Exhibition he had been requested on Wednesday to remove birds which had been scalded on the Monday, whilst others which had been dealt with by the process of dry-plucking were sold on the following Saturday. The latter birds were purchased by a person who he knew appreciated good table birds. In America a certain amount of scalding was done. In the old country the birds were brought in by the fatterer, dry-plucked, and the women did the stuffing. A person with a little bit of practice would soon become proficient in getting the feathers off quickly. The regular pluckers got to know in which way the feathers came off—there was a way in which the feathers left the birds much easier than another. The feathers were a side line which they made a good deal out of. A price of 2d. per dozen was paid for removing pin feathers in England. In Australia they did not pay attention as to the time when they should kill the birds; so long as they looked nice, that was considered sufficient. In the old country, the feathers on the birds were lifted to see the pin feathers. Having been plucked and the pin feathers removed, the birds were thrown to the person who was doing the singeing. To do this he got some straw, made a long row of the birds to be dealt with, started a fire at one end, and worked automatically. They then went to the shaping man, and eventually were packed up in readiness for sale. The birds, being warm, the flesh would solidify. The packing was done in open crates with straw, but he was afraid that this would not do here in this climate. In England they did not glut the one market; they had markets all over the country, and they worked systematically on those markets, and so got the wider field of buyers. The Sussex people, by making a particular study of table poultry, got the advantage of the market.

Questions were called for, and Mr. Harwood was asked if he would be in favour of setting out the system of feeding for the competition in the rules relating thereto?

The Principal said that he would undertake to answer the question himself. They did not change the system of feeding, which was published each year in the annual report. If they got the report, that would not entail the inclusion of the

feeding system in the rules of the competition. It was possible for them to get a copy of a pamphlet dealing with last year's competition.

In reply to another question, Mr. Harwood stated that the birds were always marketed with their entrails, because they would keep much better in that way.

Asked how long the birds were starved in connection with the table poultry fattening, Mr. Harwood stated that the length of time was twenty-four hours.

Another questioner asked for information regarding feeding, and Mr. Harwood replied that if he was to deal fully with this question he would keep them there for a week. He took it they were there that day to learn how to improve the industry. In connection with the plucking of birds, he stated that as there was an absence of pluckers here, it would probably be necessary to first go in for the scalding process. He added that an efficient dry-plucker would pluck a couple of dozen birds whilst the other person was getting his water hot. (Laughter.)

A delegate: What price per head would be a payable price to sell birds at?

Mr. Harwood: At the present time the selling of birds, as they stand—per head—I am sure does not pay. It was essential that they should sell them by weight. If they came to an understanding on this matter, then the poultrymen would get what they required, and would be able to command a price for their cockerels.

Mr. Potts (to Mr. Harwood): Will you promise to write a pamphlet on feeding during the year for the "Agricultural Journal?"

Mr. Harwood: Certainly.

Mr. Beard read the following report dealing with his tours:—"It is now twelve months since we last met in conference in this hall, and since that time I have travelled over a large portion of the State from the Southern border to as far north as Herberton. In many of the districts I visited I found the poultry-fancying industry very stagnant. This was due to the want of someone to impart the advice that is required. I came across many large plants being worked by people with scarcely any knowledge of poultry. Yet some of these people are on a good payable proposition, notwithstanding the high prices of poultry food. They were getting good returns for their eggs and surplus stock. Many of the large poultry farmers in the North hold twelve months' contracts for eggs at 1s. 6d. per dozen, whilst others are satisfied to accept the ruling prices, which range from 10d. in the flush of the season, to 2s. 6d. per dozen in the off season. Townsville and Cairns are the chief markets for the disposal of eggs and surplus stock. Mareeba I found to be the most suitable climate in the North for poultry, being located in a dry belt of country. Here one of the largest plants in the North is situated, whilst several small plants are installed. No disease of any kind came under my notice. At Cairns there are no large plants, but I met a number of fanciers there who are most enthusiastic. Since my visit, poultry clubs have been formed in Halifax, Ingham, Innisfail, Babinda, Atherton, Malanda, and Yungaburra. I am afraid poultry will not make much headway, owing to the continuous wet seasons experienced at those places, although there are many small farmers. At Townsville and Charters Towers there are some really live fanciers. In these places some very large plants have been installed. I saw in the Towers the most up-to-date poultry plant in the North. In the Ayr and Proserpine districts there are some large plants; also a lot of small farmers. Some of the yards at Proserpine were meeting with diseases in various forms. Coming back to the South, commencing at Killarney, there is only one large plant, but a fair number of small ones are being utilised. Killarney, although a large farming centre, holds the unique position of not being able to supply its own demands for eggs, the local storekeepers having to obtain supplies from Yangan, where there are several large plants installed, in addition to a good number of small ones, which are making a great success of the undertaking. Warwick has become a very large centre within the last twelve months. Over a dozen large plants have been put down, in addition to a large number of smaller ones. The most flourishing poultry society in the State is established in Warwick. At Allora, Clifton, and Nobby I found large poultry plants. Nobby I call the hot-bed of the State for Black Orpingtons. At Hidden Creek and Doctor's Creek, although I might call them outlandish places, there are some keen fanciers, who have very large plants installed. Toowoomba is another large centre of the industry. Within the last couple of years not only have several large plants been installed, but quite a number of new fanciers have come into the industry. Within the next few years we can look forward to the Downs being very large suppliers of eggs and poultry."

Mr. Potts said that the only questions which had been submitted for consideration were a series sent in by Messrs. D. W. L. Anderson, W. R. Parker, A. E. Walters, M. J. Lyons, Thomas Carpatt, and L. G. Innes. These would be dealt with seriatim. He called upon Mr. Anderson to submit the first suggestion.

Mr. Anderson, in moving the following proposal:—"That a standard for poultry be fixed and published for the next College competition, and a copy of same be printed on the entry form," said that he considered the standardisation of poultry was one which should be taken up by the Gatton College in its competition. For a number of years, in his opinion, the birds, and especially the White Leghorns, had been rather deteriorating, so far as standard was concerned. If the birds competed up to a standard laid down, giving a larger number of eggs and a greater amount of flesh, he thought the poultry industry would be greatly benefited. If they continued to breed a laying machine it was almost certain that the weight of the egg would deteriorate. That, he thought, could be shown by the chart they had in connection with the competition. As to the standard set out by the National Utility Club, he was not in favour of every item contained therein. That was agreed upon by the Utility Club's conference of delegates throughout the Commonwealth. These they were trying to have embodied into other competitions. He argued that Orpingtons and Silver-laced Wyandottes had also deteriorated in point of standard. He agreed with Mr. Harwood as to the standard, which he thought would bring birds back, not only to flesh-producers, but also to egg-producers. He considered that the standard, with a few modifications, laid down by Mr. Harwood, would be suitable. To obviate the birds deteriorating, he considered that they should take the matter up.

In supporting the proposal Mr. Innes said that the reason he would like the standard set out in the schedule was that every breeder might have a correct idea as to what birds he should pick. He had been a competitor for two years, but had never known what standard the birds were picked from.

Another delegate expressed the opinion that it would be wise for the College not to adopt this standard, because he considered it would not act to the benefit of the competition.

Mr. Finlayson said he thought they had a standard now which was moderately fair.

Mr. Evans asked if it would not be feasible, as was done in the case of cattle, to have a line of demarcation? They could have a standard for utility poultry, and a distinct standard for meat poultry, as in the cattle classes. He was prepared to say that they could not breed meat and eggs at the same time. They would come to a minimum point of success if they attempted to do that. He certainly thought that with such a man as their poultry expert, they could easily form a standard for utility birds, as against meat birds.

Mr. M. Elms said that he was present in Sydney when the standard which had been referred to had been drawn up. The decision really was the outcome of a conference on the whole of the standard breeds recognised in New South Wales and other parts of the Commonwealth. The object was to endeavour to reach a standard for utility poultry. As for the birds deteriorating, he held that the results of the Hawkesbury competition showed that that was not the case. The expert there (Mr. Adlington) (?) stated that this had not had a detrimental effect, but that the standard agreed upon had increased the stamina of the birds and the weight of the eggs. It was very noticeable, in going over the records of the Hawkesbury College, that there were very few eggs under the standard weight. In Queensland they had to admit that they could not say the same thing. In respect to the standard of the birds, they did not have the stamina they should. Of what use, then, for market purposes, were they if they were going on with that. Their birds must have the utility qualification. The keen man in the poultry industry had sufficient judgment to pick out those birds which were going to do him justice in a competition, barring accidents. In forming those standards the consensus of opinion was that it would give the poultryman something to work on, as it was desirable to see how it would work in improving the standard, so that eventually they could evolve something which would be of advantage to the whole of the country."

Mr. Wallace raised the question as to what utility was. He said that so long as the shape of the bird was not incompatible with the greatest usefulness, what was to be gained? A person had to find a breeder on whom he could rely, and to be assured that the type was correct. If he had to start afresh and work until he found the breeder on whom reliance could be placed, and who had the type he was looking for, he was going to be put to a great deal of trouble. In England they had their own shapes and types, and all had magnificent profundity. This also applied in America. If they had their types in these countries, would Australian type-breeders have to start afresh? The industry was coming on by leaps and bounds, but it was still young, and the breeders were inexperienced. They must remember that one had to walk before he could run. In introducing new blood to improve his type, he ran a big risk of breaking up his strain, which he had probably spent years to build up.

Mr. Hindes said that he felt very keenly on this question. He did not think that there were any poultrymen there that day who would have the temerity to say that some of the birds shown as Black Orpingtons had any possible chance of being considered Black Orpingtons. (Hear, hear!) The same thing might be said, in moderation, of some of the Leghorns. If they got away from shape, &c., they lost the type. Some years ago he had sounded a note of warning in respect to this matter. He had observed that the trend of the Black Orpingtons indicated that they were going to pieces. There was many a bird now shown as a Black Orpington which was scarcely as big as a Leghorn. He thought that something should be done in the matter of preserving these good old birds. Leghorns were admittedly a laying type; they had been bred for generations for egg-production alone. Then why try to spoil their good useful birds? They could not get the two extremes in the one bird. They must be satisfied with a first-class layer, a table bird, or a generally useful bird. Why not standardise and keep them to their proper place and breed—*i.e.*, general purpose fowls, layers, or table birds, as the case might be? They had got special prizes for typical birds—birds approaching the standard—why not apply the motion before the conference to that particular section for the next competition, and let those special prizes apply only to typical birds or birds approaching the utility standard mentioned there? This very nearly approached the poultry club of England's standard, with the exception of some details. This, he considered, would be a step in the right direction.

Mr. Innes said that the trouble he wanted to get over was this: Mr. Harwood picked the birds for the type prizes; there was a standard in the competition at the College to-day, but it was hard for a breeder to breed to the poultry standard competition of England and here, and in other parts of the Commonwealth. All he wanted to know was, on what standard Mr. Harwood was going to pick next year's birds. He had been a competitor for the past two years; he picked his birds, but he did not know really what he had to pick.

Mr. Harwood said that the competitions were run purely for utility purposes—it was a question of egg-production. The utility clubs throughout Australia had drawn up a standard, but that was very vague. No one standard helped a person if he had to judge every breed. It was rather a peculiar thing that the most typical pen in the whole of the competitions for Leghorns stood second place. If some men could breed birds for eggs and size, then others could do it. They might say that they could not get the number of eggs from typical Black Orpingtons—the thing was to alter the standard. He did not see what was to stop Australia from forming a fresh standard for utility purposes. They did not want to get away from the breed, otherwise they might as well go to mongrelism. If they were going to produce eggs, they had to produce size of eggs; they could not compete with the Asiatics by marketing a small egg. He urged that they should pay attention to the size of the eggs and have a minimum weight.

Mr. Potts said that he was pleased this matter had been brought up. About two years ago they had raised the question that the type of birds was going down, and expressed the opinion that something would have to be done to standardise the birds. They promised certain regulations, and had stipulated a certain weight for the eggs. They called this a 2-oz. egg. He did not intend to alter that. They had offered certain prizes for those birds true to type. Then the question had been raised as to what they meant by that "true to type." The old English standard type of Leghorn and their modern type he did not think were the same; they must vary. Referring to the argument about the line of demarcation in cattle, he said he did not think that the beef Shorthorn cow was ever going to be the same as the milking Shorthorn; but there was no reason why they should not be Shorthorns all the same. Unfortunately they had in their competitions birds entered as Black Orpingtons which showed signs of absolutely improper blood. They allowed to enter the competitions, practically any birds which complied with the utility standard, but for the "true to type" prizes they looked for certain definite conditions to be complied with. He certainly did not want to see Leghorns which were one straight back from head to tail. They could not class these as being on the standard; there must be something conforming to the type. The main idea was to produce profundity. The competition was not for the benefit of the man who was making money by a few poultry, but for those who were breeding for the distribution of birds throughout the State. He did not think that they should let the birds develop down to nothing. Utility poultry were really a high standard of egg-laying machine. They wanted to develop a superior type as an egg-laying type. If they were going to take some of the old standards, they were going to kill those birds developing into a good egg-laying strain. He would ask the conference if it would appoint two or three gentlemen to consult with Mr. Harwood and himself, to draw up the type considered most suitable for them to adopt. They wanted to be on safe ground, and he thought they should insist on "true to type" prizes, and give them to something above the ordinary utility type.

Upon receiving the assurance from Mr. Potts that he proposed to have that committee appointed, Mr. Anderson agreed to allow his proposal to stand in abeyance.

The second motion on the agenda paper was as follows:—"That the standard be the one adopted by the National Utility Poultry Breeders' Association of Australia." In view of the decision arrived at in the former matter this also was allowed to stand over.

In launching the discussion on the following proposition, "That the conditions under which competitors enter their birds for the competition be modified as to number of settings being reduced to ten," Mr. Potts said that this referred to one of the conditions which they had in their rules, which meant that the competitor had to be in a position to supply 100 settings for distribution to the public. He was being asked to reduce that to ten.

Mr. Innes, in proposing the motion, said that now that there was so much individual mating this was a rather hard condition to comply with.

Mr. Fanning said that some time ago he had supported a proposal to this effect, but he did not intend to again ask that the number be cut down. Even though those rules were enforced he was going to be bold enough to say that there were men in that room, who, although they had signed a declaration that they could fulfil the conditions, were not able to comply with them. They would put birds into the competition when they did not have half-a-dozen birds in their yards at home. He did not think that the College was going to benefit very much if they altered this condition.

Mr. Oldham said he did not think it was advisable to cut down the number. If a man had any quantity of fowls, it would not take him very long to get that number of settings. A reduction, he argued, would be against the man who was depending on poultry for a living, in preference to the person who only had a few fowls in his back yard.

Mr. Arnold said that before a person was allowed to enter the competition he had to sign a declaration that he could supply 100 settings. But the question was whether it was worth any man's while to have 100 settings? Would they be required? And were his birds of any consequence? He was coming into the competition to improve his connection, and if his birds had done well, he could rest assured that his name was made. He wanted to be successful in the competition so that he would be qualified to have 100 settings to sell. He was very much in favour that the number should come down.

Mr. Finlayson pointed out that the idea of the competition was to encourage breeders to breed birds.

Mr. Potts said that the rules were insisted on, but, unfortunately, they were not always complied with.

Mr. Finlayson said that if the conditions were for 100 settings now, he thought that ten and twenty were too low. He would favour rather a compromise of, say, fifty. Any man who entered birds should be prepared to let the public have the advantage of the competition. Unless a breeder was prepared to let the public have access to his yard, he had no right to have birds in this competition.

Mr. Irvine asked how it was known that the conditions were complied with? He entered fowls for the competition and was never questioned. He supposed that there were a number of competitors who could not comply with the condition. There was no doubt they had many of the competitors who did try to comply with the conditions, whilst others would not care a fig about them. But how did the College know that they were complied with?

Mr. Caswell pointed out that in regard to the quantity of eggs it was not stipulated in what time they were to be produced. He did not think that a man required a great number of birds to be able to supply 100 settings of eggs. The stipulation had to be signed before a justice of the peace, and that should be sufficient to guarantee its genuineness.

Mr. Dennis: Would you request that these eggs should be 2-oz. eggs?

Mr. Potts: There is no stipulation as to the weight of the eggs.

Mr. Newman said that he took it that these competitions were for the purpose of advancing poultry-keeping generally. It appeared to him that if they insisted that an exhibitor should be able to supply 100 settings they were going to block out the small man who was only feeling his way. In course of time the fanciers would get hold of him, and he would become a big fancier himself. He was in favour of the reduction. He took it that the competitions were for the purpose of increasing the number of poultry-keepers. If they insisted on the 100 settings, the small man did not get the desired fillip. He thought that it would be wise to remove the restriction to some extent; he would not say how much.

Mr. Harwood said that the competitions were run for the good of the industry, not for a few hobbyists. It was the man with a flock, not for the person with a few fowls in his back yard.

Mr. Potts said that this proviso was put in for the reason that they had not got in Queensland the same organisation which allowed them to know the breeders as well as they did in New South Wales. The declaration, which they asked should be signed before a justice of the peace, was only as a small guarantee. But he regretted to know that some of the exhibitors had deliberately flouted the guarantee. They had signed a declaration which they knew they could not comply with. That being so, the only course left open to him was to disqualify such persons for life. He did not intend to carry out that punishment this year, but if that was continued in, and the provision was violated, he would have no other option. One hundred settings only meant about thirty breeding pullets, and at the outside five or six weeks' layings. If they were not big enough to run those, then they were not big enough to run at the College and take advantage of their prizes. They wanted every man to be keen on poultry, but they did not want them to come there as a sporting competitor to win their prizes. There must be some qualification behind them. He did not think for one moment that they anticipated that he would reduce the number in any way. Rather he would have to make it a great deal more severe if it was not complied with.

Mr. Anderson submitted the fourth proposal. It was, "That the selling of poultry for market be by weight." He pointed out that there were some College birds at the recent Exhibition, and if these birds had been sold by weight it would have given the movement a start off. For some time past he had visited the markets, and he could say that during the last two years the quality of the birds had been on the up-grade. Some two years ago White Leghorns were very weedy as regards weight, but they were coming on now. He had seen them sold for 4s. 6d. per pair, whilst this had now advanced to 7s. 6d. That proved to the poultry-breeder that it was better to breed the improved class of birds. There were times, of course, when the demand for poultry went off. A lot of breeders were under the impression, apparently, that immediately before Easter and Christmas was the ideal time to dispose of their birds, but he had seen these persons send their poultry in to the markets at that time and had fallen in. He thought that they should endeavour to get the Government to realise the advantage of selling by weight. The State Produce Agency could assist them in establishing this system. He thought that the State would find this a very profitable undertaking.

Mr. Irvine said that he thought they were all agreed that the time had arrived when they should dispose of their poultry by weight. The Minister had stated that a measure was likely to be brought before the House, and he thought they should sound the spirit of the meeting, and thus do something to help this movement along. He thought they should endeavour to induce the Minister to have something put in that measure that would compel them to sell their poultry by weight alone. If that were done the breeder who bred the small birds would be the loser, and the public would know just what they were getting.

Mr. Newman said that the difficulty was to tell what the weight was. Sometimes the best-looking birds did not weigh as much as the inferior-looking ones. The great difficulty was as to how they were going to come to the conclusion as to the weight of the birds. They could not weigh the crates and their contents *holus bolus*. In some cases, the birds might be one weight when they left the yard, and another one when they were sold. (Laughter.) The whole question, so far as he could see, was how they were going to arrive at the weight. It would be a question for a committee to endeavour to arrive at an easy method of coming somewhere near the weight; otherwise the poultry industry was going to suffer in the future.

Mr. Pacey expressed the opinion that the people of Australia were not yet educated to poultry-eating. He thought this was a question which they could not go on with that day. Till Australians were educated up to eating poultry this was a matter best left alone.

Mr. Oldham said that some of the fowls sold on the market at 4s., 5s., and 6s. did not weigh a quarter of a pound when they were taken home. They wanted to give the public a share of what they were making, and they could do that by selling poultry by weight. In America poultry was sold by weight, and they found this a very profitable method.

Mr. Carey said that he had been selling poultry for the last twenty years, and his advice to breeders was to get the best birds. If they did that they would get the best prices. His opinion was that birds should be sold by weight.

Mr. Potts said that it was apparent that the conference was not unanimous on this proposal. His opinion that the system was quite essential if they were going

to give their attention to table poultry. It was possible for them to breed birds running to a high weight, but that those birds should be sold at the same rate as feathered birds was not right.

Mr. Caswell expressed the opinion that the breeders were strong enough themselves without wanting to be nursed by the Government. If they were not unanimous on this question, the one lot would go one way and the other the opposite. But they sold chaff and other varieties of produce by weight, then why not poultry?

Without having come to a decision, the conference proceeded to deal with the fifth item on the agenda paper. This was—"That poultry inspectors for diseases among poultry be educated for that purpose."

Mr. Anderson initiated the discussion. He said that his reason for mentioning this matter was this: There were many persons at the present time advocating that experts in diseases of poultry should be appointed, considering themselves experts of all diseases which poultry suffered from. He understood that Mr. Lennon was bringing forward a Bill, and he thought that it should be a recommendation to him that this matter should be included therein and brought under the Stock Acts. Further, he advocated that poultry experts appointed relative to diseases in poultry should pass an examination, to comply with the Stock Diseases Act. He also thought that it would be a wise scheme for the soldiers passing through the College to follow up this branch of the industry minutely, with the object of sitting for the examination thereon. The Minister had said that nothing could be done this session on this matter, but that it was proposed to bring it forward next parliamentary session. He (the speaker) thought that it would be a good thing to make a start in the matter now. In following out the suggestion, he thought they would get competent men appointed. As a recommendation, he suggested that the Minister should be asked to bring this under the Stock Act, and that every poultry diseases expert should pass an examination of some sort for that purpose. (Hear, hear!)

Mr. Potts said that Mr. Anderson had brought forward a matter which was of considerable importance. The only method by which they knew that the persons appointed to carry out the work of inspection were competent was by the conducting of an examination. He thought they could quite safely recommend this matter for consideration, but it would probably come better from the various clubs and not from the conference. However, he could assure them that it would be somewhat difficult to comply with the request. A great many of their poultrymen were men who had grown up in a practical school, and knew the local requirements. They would have to fall back on those sound practical men, and gradually it would be possible for a proper examination of inspectors. However, he did not think that they should put this matter through the conference that day.

In connection with the sixth matter on the paper—"That an inspection committee be appointed for the competition"—Mr. Potts said that he thought he could not let them discuss that matter at the conference, but he was going to take it as a recommendation, because he was in favour of having an advisory committee to assist them in running the competition. He had on one occasion brought the matter before the Minister and the Under Secretary, and they were half-heartedly in favour of it. It was thought that it would not be right for the running of the competitions to be taken out of their hands, but an advisory committee could do an enormous amount of work, by not having executive powers. He proposed to have such a committee appointed.

Mr. Innes brought forward a suggestion for the numbering of leg-bands on competition birds, suggesting that they should be numbered consecutively from, say, 1 to 6, and so on. This would assist the College officials, he thought, in taking the birds from the coops.

Mr. Potts said that this was only a small detail, but it was a very useful suggestion. Competitors were often very careless of the manner in which they sent along their pens, and they only wanted to be at the College when the pens were arriving to realise how much trouble that carelessness led to. He thought they might all follow out the suggestion. If they were to use consecutive numbers it would be decidedly better for them.

In connection with a suggestion regarding reserved carriages being made available for the use of the delegates, Mr. Potts said that now that the success of the conferences had been assured, they would be able to look after these details. He did not see why they should not have a special train.

A delegate asked if it would be possible to issue weekly reports in connection with the competition, and, in reply, Mr. Potts said that they did not have the staff at the College necessary to do this. Not many of them seemed to realise the amount of work which the preparation of these reports involved. They did not quite get the support from the Press in Queensland which they did in the South.

This concluded the discussions, and the conference closed with a hearty vote of thanks to Mr. Potts.

Viticulture.

PRACTICAL HINTS ON ESTABLISHING A VINEYARD.—No. 5.

By P. MAHONEY.

MANURING.

Although the soil may be rich enough to grow and produce satisfactory crops, the money spent in manuring the vine in rich soil is returned twofold, providing it is given judiciously—that is, supplying those constituents in which the soil is deficient. To do this a person should know the constitution of his soil. Most soils, rich as they may appear to be, are very often deficient in some kind of plant-food, and if that deficiency be not made up artificially the plant cannot produce to its limit. Even though the soil may be rich enough to grow and produce heavy crops, it should be maintained in that condition by light dressings of artificial manures. If manuring is practised from the commencement, the soil never becomes weakened in plant-food, but retains, and perhaps improves, the supply, which should be the aim of the successful man.

In the event of no manures being used for a number of years, the dressings will have to be heavy to keep up the supply of food, for during those years large quantities of food have been utilised by the vines, and there may be doubts about its ever again reaching its original and required fertility. For, if the vine has borne heavy crops, the utilisation of the plant-food would have been great.

If light manuring is practised from the commencement of the time of planting the vine, it would not prove as expensive as heavy manurings later on, and the crops would be more regular in time of fruiting and in quality.

The point in making a success of grapegrowing, as in anything else, is not to wait until the soil has become deficient in plant-food before supplying it, but to have a good supply ever ready for the plants. If such conditions are complied with, only half the quantity of land or perhaps less need be used to equal the results from unmanured land, thus saving enough working expenses to pay for manure.

The foods required for the upkeep of the vine and production of crops are phosphoric acid, potash, and nitrogen, all of which can be supplied artificially, although supplies of potash cannot be obtained now, owing to war conditions. These dressings—viz., 2 cwt. of superphosphate, 1 cwt. of sulphate of potash, and $\frac{1}{2}$ cwt. of nitrate of soda—when sown in the bottom of a furrow at the spring ploughing, have been proved to give the best results. Green manuring, such as the ploughing-in of field peas or tick bean, which are the best nitrogen-producers, are also highly beneficial in keeping heavy soils open and friable, as well as in producing nitrogen.

It is not always advisable to practise green manuring. For instance: If the spring rains are not too reliable, and the moisture being taken out of the ground by the peas or beans, these factors will have a tendency to retard the starting of the vine in spring time, and thus to prolong the time of ripening of the fruit, whereas it is important to have the fruit off before the wet season sets in, in which case the damage would be considerable if the fruit happened to be ripening up; and for table grapes, the earlier they are the higher price they realise. Therefore, my contention is, that nitrogen supplied artificially is much preferable to green manuring under such circumstances.

Where irrigation is installed, green manuring can be resorted to with advantage. The best method of ploughing-in green manure is to chop it up with the disc cultivator, by which means it is possible to cover every particle of the manure satisfactorily, and afford a thorough cultivation. Lime is beneficial in any soils, more especially in heavy soils, for it keeps it open and friable, thus making it easy to work, and consequently increasing its power of retaining the moisture for a longer period. It also makes food in the soil available for the plant, through its action upon the soil.

Light dressings at short intervals are better than heavy ones at long intervals.

[TO BE CONTINUED.]

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR SEPTEMBER, 1918.

Article.								SEPTEMBER.
								Prices.
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.
Barley	...	...	...	...	...	...	bush.	4s. 7d.
Bran	...	...	...	...	...	...	ton	£7 5s. to £7 10s.
Broom Millet	...	...	...	...	...	...	"	£40 to £80
Broom Millet (Sydney)	...	...	...	...	...	...	"	£90
Butter (First Grade)	...	...	...	...	...	...	cwt.	168s.
Chaff, Mixed	...	...	...	...	...	...	ton	£6 3s. to £7 15s.
Chaff, Oaten (Imported)	...	...	...	...	...	...	"	£4 15s. to £8 13s.
Chaff, Lucerne	...	...	...	...	...	...	"	£9 to £12 7s.
Chaff, Wheaten	...	...	...	...	...	...	"	£4 10s. to £7 10s.
Cheese	...	...	...	...	...	...	lb.	11½d.
Flour	...	...	...	...	...	...	ton	£12
Hams	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.
Hay, Lucerne	...	...	...	...	...	...	ton	£3 10s. to £7 10s.
Hay, Oaten	...	...	...	...	...	...	"	...
Hay, Wheaten	...	...	...	...	...	...	"	...
Honey	...	...	...	...	...	...	lb.	3½d. to 4½d.
Maize	...	...	...	...	...	...	bush.	5s. 8d. to 5s. 9d.
Oats	...	...	...	...	...	...	"	3s. 3d. to 4s.
Onions	...	...	...	...	...	...	ton	£26 to £28
Peanuts	...	...	...	...	...	...	lb.	5d. to 8d.
Pollard	...	...	...	...	...	...	ton	£5
Potatoes	...	...	...	...	...	...	"	£9 5s. to £10
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	3s. 3s. to 3s. 6d.
Pumpkins (Table)	...	...	...	...	...	...	ton	£4 10s. to £6
Pumpkins (Cattle)	...	...	...	...	...	...	"	£8 to £11
Eggs	...	...	...	...	...	...	doz.	8d. to 10¾d.
Fowls	...	...	...	...	...	...	per pair	5s. 11d. to 10s.
Ducks, English	...	...	...	...	...	...	"	3s. 3d. to 7s. 6d.
Ducks, Muscovy	...	...	...	...	...	...	"	4s. 5d. to 7s.
Geese	...	...	...	...	...	...	"	12s.
Turkeys (Hens)	...	...	...	...	...	...	"	10s.
Turkeys (Gobblers)	...	...	...	...	...	...	"	17s. 6d. to 33s.
Wheat (Milling—Imp.)	...	...	...	...	...	...	bush.	4s. 3d. to 5s.

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	9s. to 14s.
Beetroot, per dozen bunches	...	...	...	...	...	...	1s. to 2s.
Cabbages, per dozen	...	...	...	...	...	...	6s. to 10s.
Carrots, per dozen bunches	...	...	...	...	...	...	1s. to 2s.
Cauliflowers, per dozen	...	...	...	...	...	...	8s. to 17s.
Chokos, per quarter-case	...	...	...	...	...	...	...
Cucumbers, per double case	...	...	...	...	...	...	18s.
Lettuce, per dozen	...	...	...	...	...	...	9d. to 1s.
Marrows, per dozen	...	...	...	...	...	...	2s. to 7s. 6d.
Parsnips, per dozen bunches	...	...	...	...	...	...	1s. to 2s.
Peas, per sugar-bag	...	...	...	...	...	...	7s. to 14s.
Sweet Potatoes, per cwt.	...	...	...	...	...	...	3s. to 5s. 4d.
Table Pumpkins, per sack	...	...	...	...	...	...	4s. to 5s.
Tomatoes, per quarter-case	...	...	...	...	...	...	7s. to 14s.

SOUTHERN FRUIT MARKETS.

Article.	SEPTEMBER.					
	Prices.					
Bananas (Queensland), per case	10s. to 16s.
Bananas (Tweed River), per case	14s. to 28s.
Bananas (Fiji), per case	22s. to 23s.
Bananas (G.M.), per bunch	10s. to 14s.
Bananas (G.M.), per case	22s. to 23s.
Lemons (local), per bushel-case	4s. to 7s.
Mandarins, per bushel-case	7s. to 11s.
Oranges (Navel), per case	6s. to 12s.
Oranges (Other), per case...	8s. to 9s. 6d.
Oranges (Queensland), per case	8s. to 10s.
Papaw Apples, (Queensland), per double-case	12s.
Passion Fruit, per half-case	10s. to 20s.
Pears, per bushel case
Pineapples (Queens), per double-case	8s. to 11s.
Pineapples (Ripleys), per double-case	6s. to 8s.
Pineapples (Common), per double-case
Tomatoes (Queensland), per half-case	2s. to 6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	SEPTEMBER.					
	Prices.					
Apples, Eating, per case	8s. 6d. to 15s.
Apples, Cooking, per case	11s. to 12s.
Bananas (Cavendish), per dozen	2½d. to 6½d.
Bananas (Sugar), per dozen	2d. to 3½d.
Cape Gooseberries, per half bushel-case	12s. to 14s.
Citrons, per hundredweight	16s.
Cocoanuts, per sack	15s. to 25s.
Cumquats, per quarter-case
Custard Apples, per quarter-case	2s. 6d. to 5s.
Lemons (Lisbon), per case	4s. to 10s.
Mandarins, per case	3s. 6d. to 16s.
Oranges (Navel), per case	5s. to 13s.
Oranges (Seville), per hundredweight	14s.
Oranges (Other), per case	4s. to 8s.
Papaw Apples, per quarter-case	1s. to 3s. 6d.
Passion Fruit, per half bushel-case	7s. to 13s. 3d.
Peanuts, per lb.	5d. to 9d.
Pineapples (Ripley), per dozen	6d. to 2s. 6d.
Pineapples (Rough), per dozen	6d. to 2s. 3d.
Pineapples (Smooth), per dozen	1s. to 3s.
Rosellas, per sugar bag
Strawberries, per dozen boxes	8s. to 15s.
Tomatoes, per quarter-case	9s. to 11s.

TOP PRICES, ENOGGERA YARDS, AUGUST, 1918.

Animal.	AUGUST.	
	Prices.	
Bullocks	£26 to £29 2s. 6d.	
Cows	£13 10s. to £18 17s. 6d.	
Merino Wethers	46s.	
Crossbred Wethers	41s. 6d.	
Merino Ewes	34s. 3d.	
Crossbred Ewes ... ..	...
Lambs	34s. 3d.	
Pigs (Bacon)	91s.	
Pigs (Porkers)	56s. 6d.	

EXHIBITION SALES.

Animal.	AUGUST.	
	Prices.	
Bullocks	£31 15s.	
Bullocks (Champion)	£37 15s.	
Bullocks (Guessing)	£31 10s.	
Cows	£24 10s.	
Cows (Champion)	£23 15s.	
Merino Wethers	48s.	
Crossbred Wethers	74s.	
Crossbred Lambs	55s.	

THE DEEPEST BORE IN AUSTRALIA.

Mr. J. H. Hart, owner of Springleigh Station, in the Blackall district, has (says the "Pastoral Review") struck a flow of 250,000 gallons of water in a bore sunk to 6,000 feet, which is claimed to be the deepest bore in Australia. It took four years to put down. The bore struck a flow of 80,000 gallons at 4,000 feet, but boring was continued, and the water is now flowing 1 foot over casing, and increasing. The cost as the bore got deeper was very great, being up to £4 7s. 6d. per foot latterly for boring, and 12s. 6d. for casing. The temperature of the water is 198 degrees.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING AUGUST, 1917 AND 1918, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Aug.	No. of Years' Records.	Aug., 1918.	Aug., 1917.		Aug.	No. of Years' Records.	Aug., 1918.	Aug., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	0·91	17	1·51	1·70	Nambour	2·03	22	4·27	2·28
Cairns	1·88	36	2·34	3·12	Nanango	1·47	36	1·78	0·79
Cardwell	1·29	46	2·05	1·28	Rockhampton ...	1·04	31	0·45	3·41
Cooktown	1·43	42	1·99	0·79	Woodford	2·00	31	1·68	1·34
Herberton	0·67	31	1·17	1·44					
Ingham	1·40	26	3·22	1·73					
Innisfail	5·52	37	7·23	16·82					
Mossman	1·42	10	...	1·26					
Townsville	0·45	47	1·27	2·07					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr	0·48	31	1·22	3·05	Dalby	1·27	48	1·75	1·05
Bowen	0·69	47	1·15	3·05	Emu Vale	1·25	...	1·85	0·68
Charters Towers ...	0·52	36	0·83	4·03	Jimbour	1·33	...	2·16	0·71
Mackay	1·06	47	0·89	4·58	Miles	1·29	33	1·02	0·78
Proserpine	1·12	15	2·27	4·50	Stanthorpe	1·93	45	2·53	0·83
St. Lawrence	0·91	47	0·53	1·78	Toowoomba	1·84	46	1·90	1·89
					Warwick	1·55	31	2·32	0·99
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1·27	...	0·82	4·51	Roma	0·98	44	1·31	0·89
Bundaberg	1·45	35	1·22	1·14					
Brisbane	2·23	67	1·24	1·03					
Childers	1·30	23	1·35	1·28					
Crohamhurst	2·43	25	3·81	3·61					
Esk	1·67	31	2·27	0·78					
Gayndah	1·27	47	1·90	0·85					
Gympie	1·93	48	2·15	1·75					
Glasshouse M'tains	1·81	10	2·06	2·04					
Kilkivan	1·63	39	0·98	0·65					
Maryborough	1·82	47	1·29	2·35					
					<i>State Farms, &c.</i>				
					Bungeworgorai ...	0·93	4	1·65	1·62
					Gatton College ...	1·33	...	1·53	0·82
					Gindie	0·82	...	0·15	3·27
					Hermitage	1·52	...	1·95	0·82
					Kairi	1·11	4	1·53	1·67
					Kamerunga	1·56	...	...	2·51
					Sugar Experiment				
					Station, Mackay	0·95	...	...	3·17
					Warren	1·13	4	0·90	3·06

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for August this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

BANANA SNAKEBITE CURE.

A Brazilian correspondent writes to an oversea paper as follows:—"I have witnessed some remarkable cures of bites from poisonous snakes while on a trip in the district of the Rio Taquary. One of these was an Indian peon, who was bitten in the foot by a 'Yaraoca' snake. He arrived at the estancia, apparently in the final stages, bleeding from the gums and all swollen up. A drink of banana juice taken from the tree trunk was given him, and in three days he was quite sound. Another case was that of a child who was treated in the same way and recovered. I also saw the case of a bullock which was snake-bitten and seemed to be dying, unable to get up. We made an experiment by forcing it to swallow the juice. The swelling subsided, and next day the bullock was almost sound and able to graze."

[The above remedy was recommended by a Dr. Speisséger in Carolina as far back as 1749. It was discovered by a negro slave, and was said to be infallible. As a reward for his discovery, he was given his freedom and a pension for life. The directions were to crush the roots of the banana (or of horehound), squeeze out the juice, and give, as soon as possible, one large spoonful. An hour later, give another spoonful, which never fails.—Ed. "Q.A.J."]

Orchard Notes for November.

THE SOUTHERN COAST DISTRICTS.

November is somewhat of an off month for fruit, as the crop of strawberries is about over; pineapples, with the exception of a few off season fruit, are not ready for marketing; and citrus fruits of all sorts, with the exception of those grown in the latest districts, are now over. Bananas should, however, be improving, particularly if the season is favourable.

The most important work of the month is the cultivation of the orchard, as, in order to retain moisture in the soil, it is essential that the soil be kept in a fine state of tilth. Where the land is liable to wash, breaks should be left between the fine-worked land, or, even better, a good break of cowpea or other leguminous crop, valuable for producing nitrogen and humus, should be grown. All fruit pests should be attended to; cyaniding can be carried out where necessary, and is especially useful now in the case of the Red, Purple, Mussel, Circular Black, and Glover Scales. Fruit fly should be systematically fought; all infested plums, peaches, guavas, or other fruits should be gathered and destroyed, so as to prevent the spread of the pest. Sucking bugs of all sorts should be gathered and destroyed, the egg-clusters, as well as the immature and mature insects, being destroyed. Hand-gathering is as good a plan as any. Fig beetles should be destroyed by spraying with Kedzie's mixture; and the egg-clusters should be destroyed whenever found.

Bananas and pineapples can be planted during the month, taking care, in the case of the pineapples, not to set out suckers that will immediately throw out a fruit, but those that will become firmly established before they fruit. Examine the vineyard carefully, and keep it well worked. Look out for Oidium and Black Spot, and treat for same as recommended in the Orchard Notes of the two previous months.

Early ripening grapes will be reaching maturity towards the end of the month; but few, if any, will be ripe. In any case do not market too immature fruit; rather wait a few days longer, till it is fit to eat.

THE TROPICAL COAST DISTRICTS.

The main crop of pineapples will ripen during the month; and if gathered at the right time—viz., when fully developed, but not turned colour—they will carry all right South, if carefully handled and well packed. Papaws and granadillas are still in season, and will meet with a good Southern demand; they must be packed in cases containing only a single layer of fruit, and should be sent in the cool chamber. I am certain that a good market can be got for these fruits in both Melbourne and Sydney, particularly at this time of the year, when their winter fruits are off and their summer fruits are not yet on.

Watch bananas carefully for fly. Keep the orchards well cultivated.

Only ship good mangoes South; for too much rubbish is sent to Brisbane. Good mangoes will pay to pack properly, but the common sorts, which predominate to an enormous extent, will barely pay freight, if there is a good crop. The canning of good types of fibreless mangoes of good flavour is well worth taking up commercially in the North, as a ready sale for the canned fruits can be obtained.

As in the Southern Coast districts, all fruit pests should be systematically fought, and the orchard should be kept in a good state of tilth, as, once the wet season starts, there is little chance of cleaning up weeds and rubbish of all kinds, or of cultivating and sweetening the soil.

THE SOUTHERN AND CENTRAL TABLELANDS.

The earlier kinds of summer fruits, such as cherries, will ripen during the month. See that, if fruit fly makes its appearance, it is systematically fought.

Look out for Codling Moth, and continue the spraying with Kedzie's mixture.

Look out carefully for any San José scale that may have escaped the winter spraying, as, if the trees are sprayed whilst the young are hatching out, the bulk of the insects are killed and little damage is done either to tree or fruit.

The sulphide of soda spray is one of the best to use now. Keep Woolly Aphis in check, should it make its appearance, using the resin washes; or, if it and San José scale are both present, use the sulphide of soda spray.

Watch the vineyards carefully for Black Spot and Oidium. Keep the orchard and vineyard well cultivated, so as to retain all the moisture in the soil required for the growth of the tree and development of the fruit. In the warmer parts, irrigate when necessary, following the irrigation by deep and systematic cultivation.

See that grape vines have plenty of foliage to protect the ripening fruit from sun scald, but yet not so dense a foliage as to induce Oidium or Black Spot. Look out for Red Scale on citrus trees, and cyanide to check same. Look out for fruit fly in the early ripening fruits, and gather and destroy all that may be so affected.

Farm and Garden Notes for November.

FIELD.—Under ordinarily favourable conditions, harvesting the wheat and barley crops may now begin. Those who have oats for hay should cut it when the grain has formed, but before it is ripe, for then the plant is in its most nourishing condition. Destroy caterpillars on tobacco plants, and top the latter so as to throw all the strength into the leaves. Keep down the weeds, which will now try to make headway; earth up any growing crops requiring the operation; sow maize, imphee, setaria, kafir corn, teosinte, sorghum, cotton, &c. Plant sweet potatoes, sisal hemp, yams, peanuts, and ginger.

KITCHEN GARDEN.—Why do so few gardeners and farmers grow their own vegetables? This is a question frequently asked by visitors to the farming districts. The reason probably is, that vegetables require a good deal of care and attention, which means also a good deal of time taken from the ordinary farm work. In many cases it pays the farmer better to buy many kinds of vegetables than to grow them himself. The only vegetables grown on many fine farms are cabbages and pumpkins, not to class potatoes under the head. Many people have an idea that European vegetables cannot be grown during the hot summer months, but this is a great fallacy; the Chinese gardeners supply the towns with all kinds of vegetables, except, perhaps, cauliflowers, during the whole of the summer. It is, therefore, clear that, by constant work, plenty of manure, water, and some shade for seedlings, most vegetables can be produced during the hot months from November to March. If your ground has been trenched or deeply dug and well worked, the advantages will be seen during the coming months. It does not pay to work shallow-dug ground. When sowing and planting during this month, give plenty of room between the rows and the plants; otherwise they will be drawn up and worthless, and keep the ground open by constant forking and hoeing. Thin out melon and cucumber plants. It is a good plan to peg down the vines; they will then not be blown about by the wind; they will take root at intervals, and thus help the main stalk. Give plenty of water to tomatoes planted out last month. They should also be mulched. Sow cabbage, French beans, melons, lettuce, radishes, pumpkins, cucumbers, marrows, rosellas, &c., and transplant for succession in calm, cloudy weather.

FLOWER GARDEN.—Stake any dahlias which may be now above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have gone off almost; still, the garden should be in full bloom, and will well repay the trouble bestowed on it, and a little fertiliser given as a top-dressing will assist the plants to bloom and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow antirrhinum, balsam, zinnia, summer chrysanthemum, calliopsis, and nemophila.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. X.

NOVEMBER, 1918.

PART 5.

Agriculture.

AMERICAN COTTON INSECT PESTS.

A United States Government Report states that the growing of cotton in the United States continued to be interfered with materially by the ravages of insect pests, particularly of the boll weevil. The efforts of the National and State Governments have failed to find a means of eradicating this pest. However, by seed selection, plant improvement, and better methods of cultivation and fertilisation, it is possible to curtail very materially the damage that may be done by it. Insect pests of various kinds cause great loss to growers of cotton in a number of foreign countries. It has been discovered that the pink bollworm, which causes so much damage to the Egyptian crop, has obtained a footing in Mexico. The devising of measures to prevent its introduction into the United States from that country is one of the problems prominently before the officials of the United States Department of Agriculture and some of the State Bureaus. Rigid quarantine has been established, and regulations are being enforced to prevent its being brought into the country through commercial channels. The following statement indicating the activities of the boll weevil during the past season has been prepared by the Bureau of Entomology and by the Federal Horticultural Board of the Department of Agriculture:—

Cotton Insect Pests in 1916.—The cotton crop in 1916 in general was not seriously injured by insect pests other than the boll weevil, although reports of damage by the bollworm in North Carolina were numerous. The extensive early spread of the weevil in 1915 was followed by a favourable winter and unusual numbers of weevils were found, especially in the southern portions of the cotton belt. The spread during 1916 was normal, not being especially aided by storms or high winds. The weevils continued moving up to the middle of December, and almost a month after frosts had killed the greater part of the cotton. The most important features of the year were the invasion of 31,000 square miles of territory in Georgia and 4,000 square miles in Tennessee, and the spread of the insect practically to the limits of cotton culture in Oklahoma, Arkansas, and Florida.

The territory invaded in 1916 included 71,800 square miles, the second greatest gain ever made by the weevil in a single year. There were no compensating losses of territory. The total area now infested amounts to 480,940 square miles.

The terribly destructive boll weevil has never made its appearance in Queensland, the Agricultural Department having always been careful that any seed imported from America or elsewhere shall be declared clean by the officials in the above countries—whose duty it is to examine all seeds and plants exported.

GINSENG.**PROFITS FROM "FREAK FARMING."**

We have received from Messrs. Bunting Bros., of Toolooa, the following interesting extract from the "Scientific American" for March, 1918, on the cultivation of ginseng, a subject on which several articles have appeared in the "Queensland Agricultural Journal." There is no reason why this singular plant should not be grown in Queensland to as much advantage as in the United States. From all accounts there is undoubtedly a steady market for these medicinal roots in China at very high prices, and it may also be that Chinese merchants in the Southern States would be buyers of the roots, which, as will be seen by the following notes on the subject, are highly prized by the Chinese for their medicinal properties. In July last Mr. Thos. Wood, seedsman, George street, Brisbane, imported a quantity of seed from America, and several gardeners here are now experimenting with it.

The accompanying photos. of the shaded ginseng fields, and of the flowers and roots, give a good idea of the methods of growing this plant.



PLATE 24.—FIELD OF GINSENG PLANTS IN THEIR FIRST YEAR'S GROWTH.

"Among the unusual industries in America is the cultivation of ginseng, a species of 'freak farming' as it is called by the orthodox tillers of the soil.

"The root of this plant is the Chinese cure for 'all the ills that flesh is heir to.' We are apt to scoff at the notion that it is valuable as a medicine, believing that its use is a superstition handed down for generations in China. But it never fails to excite interest, perhaps because the Chinese dealers are willing to pay almost 9 dollars per lb. for these precious roots, so that the returns from half an acre of land may be easily 6,000 or 7,000 dollars—that is, if you know how to get results.

"The discovery of the plant on this continent was made over 200 years ago. The demand from China increased yearly. Then such energetic hunting began that the plant was in a fair way to become extinct, as no effort was made to see that reproduction took place, and up to about thirty years ago no one thought of cultivating this valuable root. It was even thought impossible. But a few individuals endowed with an unusual amount of faith and patience took it up as a hobby, experimenting until

they finally were successful. Here are a few of the things they had to learn before the industry was launched.

“The plant reproduces from seed, but the seeds are unusual. They will not germinate until the second season, or about eighteen months after harvesting. During this time they must be watched carefully; they have to be kept moist, but not too wet or they will rot, not too dry or they lose all their vitality. These things had to be learned through failure. One method of caring for the seeds is to stratify them in moist sand, in the following manner:—A box not more than 1 ft. deep is used, with holes bored in the bottom. Then alternate layers of the sand and seed are placed in the box (the sand should be about 1 in. thick); then a layer of berries which may touch each other but must be only a single layer; then another strata of sand which must more than cover the seeds; and so on until the box is filled, allowing at least 3 in. of sand at the top, with a layer of moss to hold moisture. The top and bottom of the box are covered with a wire screen and then buried in a shady place where the water will drain off. It is advisable to put a sloping roof over the box to prevent too much moisture; and care should be taken during summer months to prevent the seed from becoming too dry.



PLATE 25.—GINSENG FIELD IN SEPTEMBER OF FIFTH YEAR, WHEN THE SEEDS ARE RIPE.

“The patience of the ginseng-grower is further tried by the fact that after the seed germinates and the little plants begin to grow it takes five years before the root (which is of greatest importance) is matured sufficiently for use. As it requires such a small area in which to raise a profit-securing quantity, the soil of that area can be worked over and just the right substances added to make the ground suitable for this plant. The growers went direct to the forests and analysed the soil, and claim that almost any sort of ground can be made into proper ginseng soil. That which is most easily prepared is of rather a coarse texture, clay loam mixed with sand, which drains naturally. As the area is small, sand can be added to heavy clay ground to make it porous and mellow.

“The transplanting of the small roots is very important, as is also the digging of the mature roots for the market. At the end of the fifth season's growth the roots are marketable.

After careful digging the roots are washed free from mud, the safest way being to spray them gently with a hose. They are then placed in a warm room with plenty of air. All the fibrous rootlets will become brittle as the ginseng dries. Finally they can be rubbed off without injuring the skin. Roots that are hard command a poor price. A short, stubby root is preferred, rather light in colour, sponge-like to the touch, and light in weight compared to the size. We have been told so often that the



PLATE 26.—A COLLECTION OF GINSENG ROOTS OF TYPICAL SHAPES AND SIZES.
(The medal, the size of a silver dollar, gives a good idea of the size of the roots.)

Chinaman favours the root that most resembles the human form (for these very often produce queer little shapes like manikins) that we have come to believe that their supposed preference is part of the ginseng 'superstition.' But the dealers claim that this is not the case. The short single root is preferred by them. Our own doctors are beginning to think that this is no superstition after all, and that ginseng is of great value medicinally. Experiments are being made continually.'



PLATE 27.—MATURED SEED HEADS, THREE-QUARTER SIZE.

LIBERTY MILLET.

In consequence of the action taken in the United States of America deleting all names of enemy origin, the so-called Giant Panicum (*Setaria Italica*) has been renamed "Liberty Millet." Applicants for this seed will please note.



PLATE 28.—LIBERTY MILLET.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Book Societies is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
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DAIRY BREEDS.

AYRSHIRES.

L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.

JERSEYS.

T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingooora	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.

DAIRY BREEDS—*continued.*

GUERNSEYS.

Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia
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HOLSTEINS.

Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman ..	"St. Athan," Wyreema	12	47	Do.
F. G. C. Gratton ..	"Fowlerton," Kingsthorpe	1	15	Do.
R. S. Alexander ..	Glenlond Farm, Coolumboola	1	3	Do.
Ditto	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings ..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff ..	Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.
E. Swayne	West Plane Creek, Mackay	1	2	Do.

ILLAWARRA.

A. Pickels	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	Ramsay	2	22	Do.
Hunt Bros.	Springdale, Maleny ..	3	62	Do.

MILKING SHORTHORNS.

P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	Torran's Vale, Lane-field	1	9	Do.
W. Middleton ..	Devon Court, Crow's Nest	3	27	Do.
A. K. Yorksten ..	"Dunure," Miles ..	2	8	Do.

BEEF BREEDS.

SHORTHORNS.

T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan ..	"Arubial," Condamine	3	6	Do.
W. B. Slade	E. Glengallan, Warwick	2	20	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS— <i>continued.</i>				
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

FARMERS' WOOL CLIPS.

By R. WILSON, Assistant Instructor in Sheep and Wool.

As advertised on another page of this Journal, the Department of Agriculture and Stock will receive and class all farmers' clips from flocks of 1,500 sheep and under.

No lot is too small for consideration, as one bag, or even one fleece, would be classed according to the various grades contained therein.


There has been specially fitted up a new store in William street, and experts are employed to superintend all work in connection with the treatment of farmers' wools consigned to the Department of Agriculture and Stock.

The fittings of the new store include all the necessary bins, tables, woolpress, with plenty of storage room; and the officers of the Department would be pleased to show and explain them to any visiting farmer who may be interested.

Farmers should notify the Under Secretary, Department Agriculture and Stock, the number of bales or bags consigned, and also state whether they will require the usual advance.

On arrival at the store all consignments are weighed on thoroughly tested scales; weights on railway waybills are not taken as correct.

After weighing, the wool is valued at an average value of all classes contained in the parcel, and if required by the farmer an advance of 60 per cent. of value for all qualities is paid by return of post. The balance will be paid after the wool is classed and sold in various grades.

All wool is classed into the various classes contained, rebaled into neat compact bales, and branded with the departmental brand , which is the only brand in use for farmers' wool by the Department. There are many different classes into which a farmer's wool may be put. The main features considered are:—Length, colour, soundness, condition, freeness from seed and burr, overgrown, charcoal or red soil stained, and the various qualities as in crossbreds or long-wools.

The results for the period of twenty months that the scheme has been in operation have been very satisfactory to growers, and netted them a lump sum of £4,000.

Three hundred and eighty-one bales were sold, the top price realising 21½d. per lb.; and this amount of wool consisted of original parcels ranging from one fleece to twenty-eight bales.

The only preparation of wool necessary is for the farmer to skirt all fleeces lightly by removing stained pieces, rough and bitty edges, folding the fleece over, showing skin side of the wool out, turning neck and breach, and rolling from breach to shoulder, showing the shoulder wool out, thereby exposing the best part of the fleece to view.

This treatment is not absolutely necessary, but it greatly assists the work done by the Department, as that class of work is much easier done when the fleece first comes off the sheep's back than if it were jumbled into a bale or bag and broken up.

Branding.—All bales and bags should be branded with a distinguishing mark, as $\frac{J\ T}{X}$, and all marks on bales to be on top cap, or on top side flap.

[TO BE CONTINUED.]

THE LANCASHIRE COTTON INDUSTRY.

According to the United States Bureau of Census (U.S.A.), the total area of cotton lands infested by the boll weevil now amounts to 480,940 square miles; yet the present season's crop of cotton in the United States is expected to reach 15,000,000 bales. Middling American cotton—which in 1915 was quoted in the Liverpool market at 5.08d., in 1916 at 8.04d., in 1917 at 19d.—was selling in 1918 at 22.27d. per lb. This, of course, refers to ginned cotton. The present position of the Lancashire cotton trade is that during the first six months of this year there has been more money made than in any similar period in the history of the industry. The majority of firms have made record profits. Mr. F. W. Tattersall, of Manchester, in an analysis of the stocktaking result of sixteen large spinning companies, shows that in share capital there has been a gain of over 45 per cent., whilst on share and loan capital combined there has been a profit of over 33 per cent. per annum, after allowing interest on loans. The share capital of these concerns amounts to £608,552, and loans to £220,820. In the mills there are over 1,500,000 spindles. Most companies have paid either increased dividends or a special bonus to shareholders. Sufficient details are not available for reliable figures to be published relating to the weaving section of the trade, but the past six months has been a very prosperous period, especially for firms who both spin and weave. Owing to the shortage of raw cotton, and the considerable amount of machinery stopped, demand in both yarn and cloth exceeds supply, and there is every probability of big profits being continued, at any rate until the end of the war.

If it were possible to ship over Queensland cotton to England there would be a revival of the times when our cotton sent to Liverpool in 1871 totalled 2,602,100 lb., valued at £79,317. Cotton, then, was universally grown by farmers, particularly in the East and West Moreton district; and at from 3d. to 4d. per lb. for seed cotton, the crop proved to be a very paying one. When, at the close of the Civil War in America, cotton once more was shipped to England, and prices fell to 5d. per lb., the industry in Queensland died out. Under present war conditions farmers have again taken advantage of the facilities afforded by the Department of Agriculture for handling the cotton crop; and for the past three years the quantity delivered at the State Ginney has annually increased, and the prospects of cotton becoming one of our staple crops are bright. About 40,000 lb. of seed cotton were delivered, ginned, and marketed on farmers' account, during 1918; and the demand for seed for next season's planting has largely increased. As will be seen in our advertising pages, the conditions under which farmers are urged to grow cotton are most favourable, and have enabled growers to realise a good profit on the crop.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, SEPTEMBER, 1918.

The laying on the whole has been fairly good for the month. No rain has fallen, and some hot days have been experienced during the month. Considering the absence of green feed, some of the scores are very creditable. D. Fulton's "A" and "C" birds both broke their respective continuous runs at 70 eggs. Although "B" and "E" have gone broody in this pen, they have put up the highest score for a group, with the fine total of 162 eggs. In the light breeds E. Chester heads the list with 155 eggs. Broodiness is becoming more frequent, and there have been one or more cases in nearly all the heavy pens. Two cases of broodiness have occurred in the light section, viz.:—Mrs. Hunter's "B" bird and Mr. G. Prince's "C" bird. Two deaths occurred during the month, and new birds have been sent. J. Zahl's "F" hen has not yet been replaced. Several birds have been treated for minor ailments. All competing birds will be judged for "trueness to type" during October, and the results published at the end of the month. The following are the individual records:—

Competitors.	Breed.	Sept.	Total.
LIGHT BREEDS.			
*Dixie Egg Plant	White Leghorns ...	142	865
*E. Chester	Do.	155	786
*G. W. Hindes	Do.	137	770
*Geo. Howard	Do.	140	760
*C. Knoblauch	Do.	131	740
*C. P. Buchanan	Do.	129	739
*Geo. Prince	Do.	136	737
*T. Fanning	Do.	126	722
*G. H. Turner	Do.	141	721
*W. Becker	Do.	131	711
*Mrs. L. Henderson	Do.	129	705
*W. Lyell	Do.	135	701
*R. Holmes	Do.	131	698
*Oakland Poultry Farm	Do.	140	681
*L. G. Innes	Do.	134	680
*E. A. Smith	Do.	140	680
*O.K. Yards	Do.	118	664
B. Casweil	Do.	124	653
*Dr. E. C. Jennings	Do.	126	640
*Quinn's Post Poultry Farm	Do.	144	639
*Range Poultry Farm	Do.	120	621
J. J. Davies	Do.	122	620
*Chris. Porter	Do.	120	614
*Thos. Taylor	Do.	114	610
Harold Fraser	Do.	95	601
*Mrs. A. T. Coomber	Do.	122	593

EGG-LAYING COMPETITION—continued.

Competitors.				Breed.			Sept.	Total.
LIGHT BREEDS—continued.								
O. W. J. Whitman	...	...	...	White Leghorns	...	...	101	590
*J. Zahl	...	...	...	Do.	...	...	101	572
*J. M. Manson	...	...	...	Do.	...	...	129	569
*Homalayan Poultry Farm	...	...	...	Do.	...	...	134	564
R. T. G. Carey	...	...	...	Do.	...	...	90	552
Mrs. L. F. Anderson	...	...	...	Do.	...	...	121	534
*T. B. Hawkins	...	...	...	Do.	...	...	126	533
S. Wilkinson	...	...	...	Do.	...	...	101	509
*J. W. Newton	...	...	...	Do.	...	...	132	508
G. Williams	...	...	...	Do.	...	...	81	507
*Mrs. R. Hunter	...	...	...	Do.	...	...	130	507
Mrs. A. G. Kurth	...	...	...	Do.	...	...	124	504
H. B. Stevens	...	...	...	Do.	...	...	118	490
Geo. Trapp	...	...	...	Do.	...	...	110	488
Shaw and Stevenson	...	...	...	Black Leghorns	...	...	108	485
H. F. Britten	...	...	...	White Leghorns	...	...	107	475
Progressive Poultry Pens	...	...	...	Do.	...	...	111	458
B. Chester	...	...	...	Do.	...	...	102	439
P. O. Oldham	...	...	...	Do.	...	...	118	434
W. A. Wilson	...	...	...	Do.	...	...	112	407
A. W. Walker	...	...	...	Do.	...	...	120	394
HEAVY BREEDS.								
*Nobby Poultry Farm	...	...	...	Black Orpingtons	...	...	129	797
*A. E. Walters	...	...	...	Do.	...	...	144	691
*E. F. Dennis	...	...	...	Do.	...	...	133	683
*E. Morris	...	...	...	Do.	...	...	132	681
T. Hindley	...	...	...	Do.	...	...	121	665
*R. Burns	...	...	...	Do.	...	...	145	636
*D. Fulton	...	...	...	Do.	...	...	162	636
*Mars Poultry Farm	...	...	...	Do.	...	...	129	626
*W. Smith	...	...	...	Do.	...	...	123	620
*J. W. Macrae	...	...	...	Do.	...	...	120	604
*W. H. Reilly	...	...	...	Chinese Langshans	...	...	106	597
E. M. Larsen	...	...	...	Black Orpingtons	...	...	97	579
A. Shanks	...	...	...	Do.	...	...	137	557
T. W. Lutze	...	...	...	Do.	...	...	130	494
W. J. Mee	...	...	...	Do.	...	...	84	480
*F. A. Claussen	...	...	...	Rhode Island Reds	...	...	107	470
H. Puff	...	...	...	Do.	...	...	87	395
Jas. Fitzpatrick	...	...	...	Do.	...	...	103	369
Totals	...	...	...	...	...	...	7,947	39,050

* Indicates that the pen is being single tested.

DETAILS OF SINGLE HEN PENS.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	138	137	155	135	147	153	865
E. Chester	132	136	123	152	121	122	786
G. W. Hindes	158	129	124	128	122	109	770
Geo. Howard	119	125	135	126	122	133	760
C. Knoblauch	123	113	138	117	124	125	740

EGG-LAYING COMPETITION—continued.
DETAILS OF SINGLE HEN PENS—continued.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
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LIGHT BREEDS—continued.

C. P. Buchanan	115	119	127	122	133	123	739
Geo. Prince	98	136	126	128	122	127	737
T. Fanning	131	110	132	92	131	126	722
G. H. Turner	73	101	133	134	153	127	721
W. Becker	120	121	100	133	108	129	711
Mrs. L. Henderson	123	106	119	86	134	137	705
W. Lyell	121	126	125	113	106	110	701
R. Holmes	130	127	111	111	101	1.8	698
Oakland Poultry Farm	101	111	126	129	110	104	681
L. G. Innes	119	137	146	76	79	123	680
E. A. Smith	92	133	118	126	118	93	680
O.K. Poultry Yards	104	121	124	98	121	96	664
Dr. Jennings	94	132	119	101	111	83	640
Quinn's Post Poultry Farm	137	90	102	92	129	89	639
Range Poultry Farm	33	139	85	113	120	131	621
C. Porter	70	108	120	93	101	122	614
Thos. Taylor	72	117	109	93	105	114	610
Mrs. Coomber	86	112	96	103	73	123	593
J. Zahl	124	95	113	106	84	50	572
J. M. Manson	126	116	129	67	57	74	569
Homalayan Poultry Farm	118	101	81	74	111	79	564
T. B. Hawkins	106	85	115	68	86	73	533
J. W. Newton	95	125	48	72	95	73	508
Mrs. R. Hunter	81	117	31	82	93	100	507

HEAVY BREEDS.

Nobby Poultry Farm	150	131	117	112	139	148	797
A. E. Walters	106	141	83	128	142	91	691
E. F. Dennis	141	106	105	64	150	117	683
E. Morris	101	109	135	134	117	85	681
R. Burns	96	108	86	95	133	118	636
D. Fulton	117	107	98	93	65	156	636
Mars Poultry Farm	110	120	99	106	95	96	626
W. Smith	150	118	43	102	93	114	620
J. W. Macrae	64	71	124	98	119	128	604
W. H. Reilly	104	124	107	58	92	112	597
F. A. Claussen	85	84	69	91	94	47	470

DOES POULTRY FARMING PAY ?

Mr. I. W. Seymour (a returned soldier) contributes to the " Victorian Poultry Journal " some practical details regarding above. In August, 1917, he purchased 14 birds at a cost of £8 7s. His experience is given as follows:—

On 10th September last we hatched 40 chicks from incubator, and another 40 on 1st October. We had 26 cockerels from this lot; some died, principally owing to want of experience on our part. We have eaten 10 or 12 (saving butcher's meat), and now have 3 fine cockerels eight months old, worth, I am told, £2 2s. each, for sale. We now have the 13 old birds—still laying us a dozen eggs a week—just getting over the moult, and 26 fine pullets, just mostly coming into the " lay," the 10 laying at present returning us 54 eggs for the week ended 12th May, 1918. I

have erected (iron) single-testing sheds for eleven birds, 3 by 6 by 5 ft.; and in them are 11 of the young pullets being tested singly for next year mating knowledge. These sheds cost me, without labour, £10 12s. 6d.

From commencement I have purchased best feed, mostly as laid down by your paper, at full market rates. Cost of feed to date, £9 7s. 6d.; value of eggs laid to date, 223½ dozen at 1s. per dozen, £11 3s. 6d. (I have just sold 9 dozen at 2s. 4d. per dozen wholesale); excess value of eggs over cost of food, £1 16s.; and we are only just now on the threshold of getting any money back. By the end of next week (19th May, 1918) I hope to have 24 pullets laying; and if they do as well as the 10 already laying, you can easily figure out the result. As you know, feed is extortionately dear—wheat, 5s.; maize, 5s. 2d. &c.

The June issue of the "Victorian Poultry Journal" contains some interesting correspondence in connection with the above question. Mr. E. H. Gibbs, of South Camberwell, writes at some length, and from his letter we take the following:—

On 1st May, I had 17 pullets, 6 second-year hens, and 2 roosters, or 25 fowls in all. During May and June very few eggs were gathered, and things began to look gloomy, and I had one of the "cold" turns. Then the mating and breeding season came along, and the temperature went up to fever heat, busied myself buying incubators, brooders, &c., and altogether became thoroughly interested in the work, which culminated in hatching the little balls of fluff which delight the eye, and, perhaps for the first time, awaken the wife's interest in the venture, as she has hitherto been keenly criticising the expenditure. Then on with the anxious time of rearing the young brood; and I might here state that in my opinion the rearing of the chicks is where the utmost care is necessary, for 30 dead in two nights was one of my experiences by being too kind to them, and I ultimately succeeded in rearing about 170 strong chickens, and from them 87 pullets and 4 cockerels, having sold a few and eaten others.

Now for my balance-sheet and comparison of assets for the twelve months:—

BALANCE-SHEET.

	<i>Receipts.</i>	£	s.	d.
From sale of eggs	23	14	6
From settings of eggs	1	1	9
From sale of chickens	0	9	0
From young cockerels	2	7	9
To debit	2	15	10
		£30	8	10

Expenditure.

Feed, kerosene, &c. .. .. .	.. .. .	28	5	10
5 per cent. interest on capital of £43 .. .. .	.. .. .	2	3	0
		£30	8	10

COMPARISON OF ASSETS.

	1st May, 1917.	£	s.	d.
17 Pullets, at 5s.	4	5	0
2 Roosters, at 5s.	0	10	0
6 Second-year hens, at 3s.	0	18	0
To Cr. balance	23	10	0
		£29	3	0

30th April, 1918.

87 Pullets, at 5s. each .. .. .	.. .. .	21	15	0
20 Breeding hens, at 5s. each .. .. .	.. .. .	5	0	0
6 Hens, at 3s. each .. .. .	.. .. .	0	18	0
2 Roosters, at 5s. each .. .. .	.. .. .	0	10	0
4 Cockerels, at 5s. each .. .. .	.. .. .	1	0	0
		£29	3	0

or a credit balance on the whole of £20 14s. 2d. for the twelve months. I have assessed the value of the pullets at 5s. each, but they are worth much more.

The Horse.

OUR HORSE-BREEDING INDUSTRY.

Under this heading, with the sub-heading "Haphazard Methods," a contributor to the "Australian Farmer," Melbourne, 15th August, writes:—

Reports of the doings of Australian horses in Egypt and in France leave no doubt as to their superiority so far as toughness is concerned. The sizzling heat of Egypt and the freezing winters of France seem to be alike tolerable to them. American and Continental horses are easily outclassed by the Australian-breds. Official reports are laden with enthusiastic praise of the wonderful endurance of the mounts of our Light Horse Regiments in across-desert stunts.

Taken straight off fresh water on to the brackish—almost salt—desert well water, 900 horses carried our boys on a long journey over sand dunes for many days. Saddles were rarely removed; drinking-places were precariously distant from one another. For several days at a time the poor game brutes were without water; but these hardy Australian equines did not fail. They went and returned, the only casualties being one horse lame, and two developed colic.

The Arabian horse is outclassed in his own country by the military horses of Australia. There is ample evidence of the fact in the reports of trustworthy officers. It even has been asserted that the camel cannot "get away with" the Australian horse in desert travelling.

From France come glowing reports of the endurance of our horses—horses that have survived all manner of hardships in more than three years' transport work. They have survived—or, rather, 60 per cent. of them have worked incessantly throughout nerve-racking, muscle-straining service close to the firing line. It was not fair average toil, for the wheels often sunk until the wagon floors scraped the slushy surface. Horses which came from other sources to fill the occasional gaps in the Australian teams proved but poor substitutes.

From the veterinary hospitals we learn of the wonderful response to veterinary treatment made by wounded Australian horses.

In Egypt there seems to be no limit to their toughness. One official report concludes:—"If a reasonable quantity of water is kept up to these horses, they will go on practically indefinitely."

The popularity of our horses at the Front is undeniably great. A returned officer tells that the first question English "heads" ask, when applying at the depôts for equine reinforcements, is: "Have you any Australian horses?"

Little wonder that our khaki-clad boys abroad display so much affection for their four-footed comrades. Australia is the finest horse-breeding country in the world. Its indigenous grasses are not only extremely nourishing, but they retain high feeding value for months after they have become browned and shrivelled for lack of moisture. The climate is so genial in this land of sunshine as to make the winter stabling of stock unnecessary; but what contributes more than anything else to the creation of toughness in the Australian horses is, perhaps, the severe droughts that come so irregularly, yet so surely.

In the drought-stricken parts beyond the track of the plough, hundreds of horses perish from hunger and thirst. Ere rain comes, the survivors are merely moving shapes of bone and hide. Their toughness is amazing, for they seem to be able to retain a grip on life when there is apparently nothing edible and no moisture to sustain them.

When the rain comes, the rested and sweetened earth quickly gives forth abundant succour to its dumb dependents. The long-starved horses exhibit their powers of recuperation by making marvellously rapid return to robust condition. The climatic eccentricities of Australia have been an appreciable factor in creating the now-established toughness of our horse stock, since for generations succeeding droughts have left only the strongest equine individuals to sustain our horse-breeding industry. Nevertheless, we must remember that the horses shipped overseas from the Commonwealth represented the cream of our utility studs. The military buyers combed every State and searched every hole and pocket to get horses good enough for shipment.

LACK OF METHOD.

Our breeders, as a whole, must not plume themselves because Australian horses have gained such favourable notice at the Front. Rather, they should look at the thousands of horses that the military buyers declined to take. Soon they would realise that there is something wrong with our horse-breeding industry, something wrong with our methods of production—a fact which ought to arouse in our horse-

breeders early recognition of the haphazard means by which the industry they represent is kept in existence.

The sheep man carefully culls his studs and flocks, and is ever alert to employ the best stock procurable to improve his products. He will not put a price on his best ewes.

In ridiculous contrast is the attitude of the average breeder of utility horses, who will sell anything. When he discovers that a mare is an indifferent worker, he finds a way out of a difficulty as to what he shall do with her by "sending her to the horse." On the other hand, when asked why he does not breed from an extra good mare, the usual reply is: "Oh, I can't do without her."

Often it may be noticed that the small breeder sends to the stud only mares that he can easily do without.

It must be admitted that the oft-recurring depression of market values has been responsible for the evident indifference with which the landholder views his little horse-breeding side-show. During the past fifteen or sixteen years, military requirements have made our horse export trade an important one. At varying periods big orders have come for war horses. The rush with which big shipments were collected for this purpose enabled owners to get rid of a big percentage of undesirable horses as well as their best sorts.

SACRIFICING MARES.

One of the most regrettable influences towards the deterioration of our horse stock has been the indiscriminate sale of good mares for shipment overseas. During the Boer War thousands of mares were sent away. For the Boxer War, in China, the German Government purchased, at a high price, hundreds of very fine horses, which included a big percentage of the best mares in Australia. When Japan was at war with Russia, representatives of the Mikado bought thousands of serviceable horses. With them went at least hundreds of mares of superb conformation.

Amongst the hundred and thirty-odd thousand horses shipped since the present war began were many high-class mares, although it is comforting to know that the Defence Department issued an instruction that kept the exportation of females down to a reasonably small percentage.

It would be a low estimate to conclude that within the past twenty years Australia has lost 50 per cent. of her best mares to oversea bidding. The Indian trade, since its inception forty-six years ago, has taken, perhaps, mares to the proportion of one-third of each shipment. Horses exported to the order of the Indian Government in time of peace are only of the highest military classes, so that the loss in mares in this direction alone has been so great that several of the shippers themselves have recently advocated schemes for the prohibition of the exportation of good mares.

THE GOVERNMENT MUST MOVE.

Not only is legislation urgently needed to prohibit the exportation of choice mares and to prevent the use of mongrel and unsound stallions, it is imperative that the Federal Government should move practically in the direction of guiding and assisting those engaged in the horse-breeding industry in every way possible.

We do not suggest that the Government should enter into competition with private enterprise, but that experimental breeding farms should be established, to discover to breeders the best methods of production, and to create for those needing instruction examples of the most marketable types.

The only recognition made of the recommendations which resulted from the important horse-breeding conference held in Melbourne a couple of years ago was the formation of a remount stud at Maribyrnong last year. Certainly this is a step in the right direction, because operations are being conducted by men experienced in the horse-breeding business. Something like 100 high-class mares, selected from the thousands purchased for the war at an average of £20 1s. 7d. per head, have been mated with high-class thoroughbred stallions for the production of military horses. The stallions now at Maribyrnong are:—Three Star (a good performer under heavy weights), Jolly Maltster (a proved sire of good stock), Piastre (winner of the Melbourne Cup, V.R.C. Champion Stakes, and other weight-for-age events), and Malt Flag (a half-brother to Red Signal, and himself a good performer and tried stock-getter). Piastre is one of Australia's greatest stayers. Three Star and Malt Flag—respective winners of the big prizes for best remount sires at the Sydney Royal Show of 1917 and 1918—were presented to the Defence Department.

The mares so advantageously collected by the Remount Department for the formation of the stud at Maribyrnong have exacted the admiration of front-rank breeders and men engaged in the Indian trade. They are identical with the class being ear-marked in France by the Imperial Remount Department to mate with blood horses in England, after the war, to produce hunter-type cavalry horses.

Piastre, Three Star, and Jolly Maltster, together with half a dozen mares and a team of cavalry horses, were taken over to the last Sydney Show as a non-competitive exhibit, which aroused the enthusiastic approval of the Press and of the many

horse-breeders and others on the other side of the Murray. This one Government stud is but a small start of a necessarily larger scheme, which should embrace the raising of high-class stallions which could be made available to breeders at a low service fee.

THE REPATRIATION SCHEME.

The repatriation scheme, which is to provide for the placing of thousands of returned soldiers on the land, reminds us that fresh influence will be brought to bear upon the future of our horse-breeding industry. These soldier settlers may be depended upon to swell the ranks of small horse-breeders. Their numbers will make their combined operations in this direction an important factor in raising or lowering the standard of our equine stock.

The Remount Department, now well experienced in the buying and distributing of horseflesh, is fully equipped with the machinery to guide the soldier settlers in the matter of laying a good foundation for their horse-breeding operations.

So far, we understand, the Repatriation Department has not enlisted the services of the Remount Department in procuring horses for the returned boys; nor has it given any apparent consideration to the horse-breeding possibilities of the scheme.

Only mares, and mares calculated to produce first-class stock, should be issued to the soldier settlers. The establishment of the Remount Stud, which embraces four valuable stallions, suggests great possibilities in the direction of supplying to the returned soldiers mares that have been mated with one or other of these stallions.

The horse-breeder of the future will be the small farmer. The big horse-breeding stations practically have faded away before the march of closer settlement. Thousands of small holdings have succeeded them; and thousands of small farmers are doing the horse-breeding. This multiplication of controlling influences means an immense increase in the varieties of type. It means a deplorable lack of uniformity; and it also means that our horses will rapidly deteriorate if something is not done at once to put our horse-breeders on the right track.

The farmers of the Wangaratta district have decided, through the local organisation, to invite kindred bodies to combine with them to urge the Government to do something for the horse-breeding industry.

THE COMING DEMAND FOR HORSES.

From the same source we take the following article by B. Folliot Sandford:—

The effects of the present war are, of course, felt directly or indirectly by all members of the community and in all branches of industry. In commercial circles the prices of commodities have been so largely increased that the cost of living has become a very serious problem indeed. The enhanced price is not as yet observable in the case of horses—heavy or light—which are now obtainable at lower figures probably than have hitherto existed in this country. There would appear to be no dearth of supply for present purposes, but the quality of animal available is certainly inferior to those with which our saleyards are usually stocked in normal times.

There are, doubtless, other factors besides the war operating upon the prices of horse stock, but it is certain that when the times of peace return the public will have to pay—and pay well—for all classes of horses. During the currency of the war the best horses available the world over have been sought out for army use; during the first nine months no fewer than 60,000 horses were sent from Australia alone, and there has been a steady drain upon our reserves ever since. Very few, if any, will return into civil use, because those which survive the dangers and terrors of the battlefield will—at least as regards most of those sent from this Commonwealth—be absolutely debarred by the rigid laws of quarantine. They must be viewed, therefore, as non-existent, and consequently, with the return to peace conditions, our horse stock must of necessity fall far behind requirements.

Owners of mares will find it to their great advantage to prepare for the approaching demand by raising foals freely; but in doing so it is imperative that the question of quality must be studied. It is well to remember in this connection that the opinion accepted as that of the general public upon any subject is that formed by, and based upon, the utterances of certain persons whom the majority of the public itself, consciously or unconsciously, has invested with perfect knowledge of that particular subject. The natural result of this act of faith or folly is that upon most subjects, at one time or another, the public is carried away *nolens volens*, and little by little an erroneous standard is established, to which the public—as a whole or in the main—not only consents, but blindly accords its hearty support.

This has for long been adversely affecting the quality of our Australian horses; and horse-breeders would act wisely by seeking advice of undoubted value upon the highly important subject of the selection of sires, because, since horse-breeding on sound lines has of late been to a great extent departed from, a very nondescript class of stallion will be rushed into service when better prices prevail.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE,
GATTON.

MILKING RECORDS OF COWS FROM 31ST AUGUST TO 30TH SEPTEMBER, 1918.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commer- cial Butter.	Remarks.
			Lb.	%.	Lb.	
Auntie's Lass ...	Ayrshire ...	1 Aug., 1918	1,237	4.2	58.26	
Gay Lassie ...	„ ...	29 Aug. „	998	4.0	44.60	
Iron Plate ...	Jersey ...	1 Sept. „	761	5.0	42.95	
Netherhall Q. Kate	Ayrshire ...	29 Aug. „	771	4.2	36.27	
Miss Betty ...	Jersey ...	9 June „	387	7.2	30.96	
Nether-ton Belle ...	Ayrshire ...	30 Aug. „	661	3.8	27.99	
Yarraview Ida's	Guernsey ...	5 May „	455	5.2	26.81	
Hope						
La Hurette Hope	Jersey ...	10 July „	355	6.2	24.20	
Violette's Peer's	„ ...	31 Aug. „	481	4.4	23.75	
Girl						
Burlesque ...	„ ...	25 Aug. „	533	3.8	22.56	
Skylark ...	Ayrshire ...	25 July „	561	3.6	22.44	
Rosine ...	„ ...	26 Aug. „	622	3.2	21.94	
Lady Melba ...	Holstein ...	31 Mar. „	618	3.2	21.80	
Sweet Meadows ...	Jersey ...	1 Sept. „	503	3.6	20.12	
Miss Security ...	Ayrshire ...	19 July „	500	3.6	20.0	

CALCULATING BUTTER FAT AND "OVER-RUN."

It is estimated that 100 lb. of fat in cream is equivalent to 103 lb. fat in milk. This is accounted for because the loss of fat in the skim milk falls upon the suppliers instead of the factory, and other minor losses in manufacture are avoided. In a general way it may be said that the over-run in milk, when samples are taken with great care and all the apparatus is correctly graduated, will average about 16 2.3 per cent.—that is, the pound of butter made will be one-sixth more than the pound of fat in the milk. With cream testing from 25 to 35 per cent. fat, the over-run will average not far from 20 per cent. That is to say, 100 lb. of fat in cream is expected to make not less than 120 lb. of butter. Stated in another way, the fat in cream will produce on the average about 3 per cent. more butter than the fat in milk. Hence, to adjust the returns in a factory where there are both milk and cream suppliers, it is suggested that the fat in the cream be reduced to its equivalent in milk by adding 3 per cent. to it. Thus, if Supplier A furnished 1,000 lb. of 4 per cent. milk, and Supplier B 100 lb. of 25 per cent. cream, the former should be credited with 40 lb. of fat, and the latter with 25 lb. plus 3 per cent., which would be 25.75 lb., and the total fat upon which to base the return would be 65.75 lb. It costs somewhat more to make butter from milk than from cream, for there is the expense of running the milk through the separator and the cost of the extra vats and pumps for storing and handling the milk and the skim milk. This extra expense would vary with the amount of milk. It would be scarcely appreciable as between 10,000 lb. and 11,000 lb.; but the extra expense might amount to about 2s. for milk; enough to make 100 lb. of butter.—“ Australian Farmer.”

The Orchard.

SAFETY ATTACHMENT FOR A FRUITGROWERS' LADDER.

Many of our best citrus and other orchards are situated in hilly country, and where trees are planted on hillsides the gathering of the fruit requires that the ladder shall be firmly planted. Ordinarily a block of timber is placed in position at the foot of the ladder on the lower slope. This has occupied the attention of Mr. L. Stemp, a well-known fruitgrower at Palmwoods (N.C. Line); and he has devised a simple means of adapting an attachment to a ladder, by which, on reasonably sloping ground, the latter stands as it would on level ground, thus obviating all danger of a capsize down hill. The accompanying sketch gives a clear idea

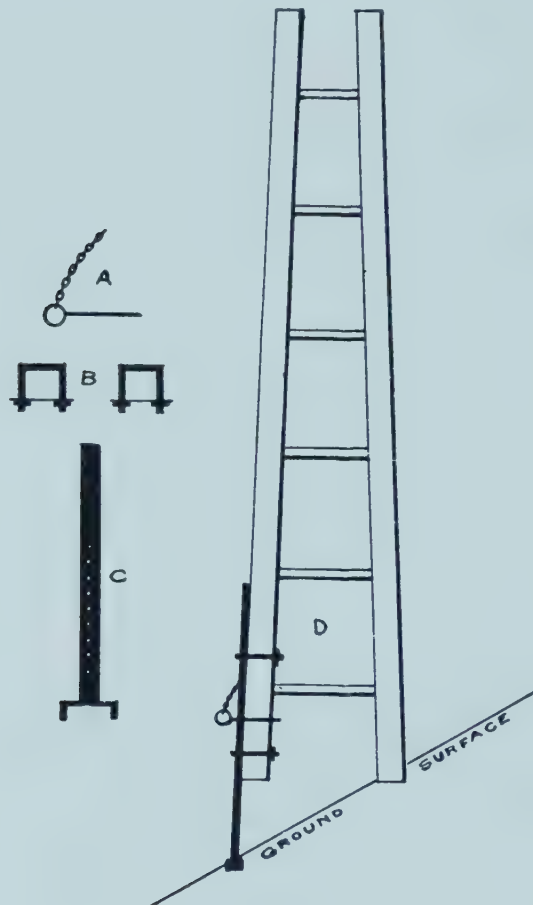


PLATE 29.

of the attachment in operation. Mr. Stemp has patented his invention, which, like many more important inventions, will doubtless come into general use. He names it "The Fruitgrowers' Ladder Attachment for Safety on Hillsides."

The whole attachment only adds $3\frac{1}{2}$ lb. to the weight of the ladder, and may be adjusted to any variable surface, as shown in the sketch, or it may be either removed, if not needed, or slid up. The bar has 5 holes, 2 inches apart. On the ladder foot there are 2 holes, 3 inches apart, 5 and 8 inches respectively from the bottom, to receive the pin.

Horticulture.

THE ROSE.

The great secret in successful horticulture is a perfect knowledge of the seasons, so as to adapt each variety of cultivated flowers to the needful temperature and rainfall. For roses to give complete satisfaction, they must be allowed ample room for the roots to spread and feed, with plenty of light and air to ripen the wood. Hence, seasonable planting, seasonable pruning, and seasonable working are the elements of success.

The proper season for planting roses is from March to August, and the main pruning should be done in June or July. The cuttings may be planted in beds for future setting out. The freest flowering roses are the Tea, Noisettes, Bourbons, and some of the hybrid Chinas and perpetuals. Some of the Teas and Noisettes will bear pruning whenever they are at rest and out of bloom, and this process will hasten their blooming again. Hybrid perpetuals must only be pruned during the main pruning season.

The best soil for roses is a deep, rich, strong loam free from stagnant moisture. Some like a sweet clay subsoil. Sandy, gravelly soils are not suitable. But, if such are the only soils available, they must be improved by a dressing of strong loam in conjunction with cowdung or nightsoil. The latter, if properly prepared, and not too fresh, is really the very best manure for roses in all soils except those which are naturally rich. If artificial manures are used, the trees will be much benefited by a manurial dressing once in three weeks of 1 lb. of nitrate of soda to from 50 to 75 gallons of water. After application, moisten the soil slightly. Old stocks require more dilution—say, 100 gallons of water to 1 lb. of nitrate. The soil may be soaked with this. Heavy soils are improved by adding burnt earth or gritty refuse with stable manure and leaf mould or cocoanut fibre refuse. Damp soils must necessarily be drained. Roses require a constant annual supply of manure, with liberal supplies of water, during the growing season, and especially must they be kept clear of aphides and other insect pests. This may be done by dusting them with tobacco dust when the branches and leaves are moist with dew and washing it off with a syringe next day, or spraying them with tobacco water or kerosene emulsion. A very effective spray pump is the Cyclone, which may be obtained from most seedsmen. It possesses the advantages of lightness, cleanliness, and effectiveness, and is especially adapted for ladies' use in the bush or hot house, or for garden spraying, being easily worked. It delivers a fine spray, which may be rendered heavier by working the plunger quickly. Used with a spraying fluid of extract of tobacco, whale-oil soap, or kerosene emulsion, it is effective in searching out green fly or mildew on delicate flowers and roses. For orchids and ferns the spray should consist of ammonia sulphate. It is also very handy for spraying the walls and roofs of poultry-houses.

Some growers prefer to grow roses on their own roots; others, on briar stocks. When growing on their own roots, should the tops die down from any cause, the roots will throw up fresh shoots true to their kind; whereas, if the grafted rose dies back, nothing will come in its place but the original briar. When dwarf beds of roses are required, a good plan is to peg down, to within about 6 in. from the ground, the strong one-year-old shoots from the root. In due time blooming shoots break out from nearly every eye, and masses of flowers are secured; while strong, young shoots are sent up from the centre, the plant being on its own roots. Before the winter, the old shoots which have then flowered and exhausted themselves may be cut away, and three or four more of the strongest and best-ripened young shoots are reserved for pegging down in the following season, say, in July or August. In the meantime, after the pruning has been effected, plenty of good manure should have been dug in around the roots. Thus treated, the plants never fail to produce plenty of strong wood for pegging down each season. To make kerosene emulsion, use 8 oz. of ordinary soap cut up and dissolved in 2 gallons of boiling water. When dissolved, add cold water to 4 gallons and 2 gallons of kerosene, well stirred during use. The emulsion must be warm when used. Tobacco spray is made with two fluid ounces of black leaf tobacco to one gallon of water.

Viticulture.

PRACTICAL HINTS ON ESTABLISHING A VINEYARD.—No. 7.

By P. MAHONEY.

IMPLEMENTS AND METHODS BEST ADAPTED TO CULTIVATION.

One of the most important factors in caring for a vineyard and bringing it into bearing early is cultivation. To conserve all the moisture possible for the plants' requirement, and to tide them over dry spells without any loss of growth or fruit, depends upon the cultivation, which cannot be too widely advocated, for it also has many other advantages, such as keeping down weeds and grass, which are moisture robbers, and also by disturbing the soil, thus affording the light and air more scope for action upon it, which action sweetens the soil and makes available plant food which otherwise would never be fit for assimilation by the plants.

Enormous quantities of moisture can be lost through leaving the cultivating until after the surface soil has become crusted and hard. When these conditions prevail, the moisture is drying out rapidly. If the ground has a tendency to set hard and become crusty before it is in a fit condition to be cultivated (as some soils will), that difficulty can be overcome by harrowing the land with a light harrow when it will just carry the horse without bogging; and such treatment will prevent the surface of the soil from caking, and results in a fine and thorough cultivation later, otherwise the soil will be in a cloddy condition after cultivation, thus affording greater scope for evaporation of moisture.

It is very important that the cultivation of the vineyard should continue until the vine has ceased growing. It is bad policy to discontinue cultivating after harvesting the fruit, for it is just as important for the plant to be supplied with abundance of moisture after harvest as before, to enable it to furnish rods with plenty of matured buds for the following crop. The plant needs to be supplied with plenty of moisture right up to the time when it becomes dormant. If this treatment of the vine is neglected after it has produced a crop or crops, its constitution is weakened, and consequently it becomes less productive every year (for, like human beings, it needs nourishment just as do the former as much after a heavy day's work as before it to store up energy for the following day's task). Good treatment to the vine after harvest plays just as an important part as manuring does.

To afford a thorough cultivation to a vineyard, a two-horse implement is essential, so as to admit of close working without damaging the vine, for with a one-horse implement it takes three times as long and greater risks are run, as it is difficult to cultivate close to the vine, and the work is not as thorough, as some ground is likely to be missed. A two-horse Planet Junior cultivator is generally the favoured implement, for it does good work at a minimum of cost. With this implement the ground under the vine can be disturbed right up to the butt of the vine without doing any damage to the vine or foliage, thus saving a lot of labour in weeding, &c., under the trellis. I find the small duck feet tines do the best work, for they leave the soil in a fine mulch, and they are more likely to destroy weeds, &c., than the other tines. A general weeding of the vineyard can be done by fixing the weed-cutting tines on to the cultivator and running them just deep enough to sever the weeds and undesirables below their crowns. This being done on a hot day has a beneficial effect in cleaning the vineyard.

The disc cultivator is a very useful implement when the vineyard is dirty and hard to keep clean, for it is an ideal implement for chopping up weeds, &c. It is more effective than the tine cultivator. But it has a few disadvantages, for it is of a heavy draught, and needs two strong horses to pull it when set to do good work. It also has a tendency to pack the subsoil tight through the discs, continually pressing the soil down. But it is a very useful implement in breaking up cloddy ground and where the soil is of a heavy nature. Both disc and tine cultivator can be made good use of in a vineyard.

[CONCLUDED.]

Botany.

BOTANICAL COLLECTION IN PAPUA.

The Government Botanist (Mr. C. T. White) has recently returned from a five-weeks' stay in Papua, which he visited as the guest of the Lieutenant-Governor—His Excellency Judge Murray—for the purpose of studying and collecting specimens of the vegetation, of which comparatively little is known. The shortness of the stay did not allow of a very detailed examination being made nor a number of places being visited.

The vegetation about Port Moresby (Mr. White says) reminds one of poor forest country in North Queensland, consisting for the most part of grass-covered hills with scattered white-barked Eucalypts of stunted growth dotted about. Other very common trees on the hills are *Alstonia scholaris* (Milky Pine) and *Albizia procera*. The Nut Fern (*Cycas*) is also very common. In the gullies and round the sea-beach are found patches of thin scrub supporting a more varied flora. Every here and there bright masses of scarlet can be seen—the flowers of *Bombax Malabaricum* (the Silk Cotton Tree)—a large tree ranging through North Australia, New Guinea, and Tropical Asia. Round about the rocky sea-coast near the town a species of *Cochlospermum* (a small tree) is also very noticeable on account of its abundance of large, bright, yellow flowers.

After a few days' stay in Port Moresby, Mr. White left—in company with the Papuan Government Geologist (Mr. E. R. Stanley, B.Sc., F.G.S.) and fifteen carriers—for the Sogeri Plateau and Javararie, *via* Sapphire Creek and Hombrom Bluff. On the Astrolabe Range (about 2,000 ft.)—Hombrom Bluff, Mt. Warirata, &c.—vegetation for the most part is of an open character, the principal forest trees being *Eucalyptus* spp. *Casuarina nodiflora* (a species of Shea-oak not found in Australia), *Banksia dentata* (a Honeysuckle), *Melaleuca* sp. (Tea-tree), *Diplanthera tetraphylla* and *Timonius Rumphii*.

On the Sogeri Plateau itself the vegetation is very rich and tropical, being mostly evergreen jungle, reminding one very much of the "scrubs" of North Queensland, but perhaps of a more tropical nature.

Sogeri Plateau is a great centre of rubber cultivation, and several large and successful plantations have been established.

Further on, Javararie—nearly 50 miles by road from Port Moresby—is one of the oldest rubber plantations, and produces some of the finest rubber in the Territory; but the lack of decent road communication with the sea-port militates greatly against its financial success. Botanically, round Javararie the country is particularly rich and tropical in character, and a large number of plants was here gathered.

A few days after returning to Port Moresby, Mr. White left for Yule Island and the Mafulu district, again having the advantage of the company of Mr. Stanley. At Yule Island twenty-five native carriers were obtained for carrying the camping outfit, collecting gear, specimens, &c. The journey was made over to the mainland and up the Ethel River as far as Bioto by native canoes, a most comfortable method of travelling in favourable weather.

Time did not permit of much collecting along the banks of the Ethel River, though the mangrove swamps, Nipa palms, and rich tropical vegetation fringing the banks of the river and of Bioto Creek promised a rich field for the botanist.

On reaching Bioto, the canoes were drawn up on the bank and the five days' march to the mountains commenced, the following places being stopped at *en route*:—Kubunah, Fofofoto, Dilava, Deva Deva, Mafulu, and Bella Vista.

An excellent well-graded road has been surveyed and made under the direction of the Mission Fathers from Bioto as far inland as Ononge, which makes travelling in this country comparatively easy; and travellers in the Mekeo, Dilava, and Mafulu districts—the sphere of influence of the Roman Catholic Missions—are indebted to the missionaries for the facilities with which travelling can be accomplished in these parts of Papua.

The vegetation in the mountain country is extremely rich and varied—ferns, lycopods, orchids, begonias, palms, bamboos, and other tropical forms predominating.

In the Mafulu country, as in other mountain parts of Papua, the most appreciated article of trade with the natives is salt, with which carriers can be paid and provisions bought. Unlike the coastal people, the mountain folk do not press for tobacco in payment of services rendered, but always for salt, matches, beads, &c., tobacco of good quality being largely grown in all the mountain villages.

Mr. White has not, of course, had time as yet to go critically through his collections, but expresses himself as well pleased with the results, considering that, besides a number of species new to science, he has collected a number of Australian and other plants as yet unrecorded for New Guinea.

Entomology.

THE SUGAR INDUSTRY.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from the Entomologist to the Bureau, Dr. J. F. Illingworth:—

With reference to the editorial "Dealing with the Cane Grub" in the August "Sugar Journal," we certainly do appreciate suggestions from men of experience. Indeed, the success of our problem rests largely with the growers themselves. Experimentation, with us, is necessarily limited to the restricted area about Gordonvale; and it is only by free discussion and suggestions that we can hope for early conclusions. The problem is a tremendous one; and a man, single-handed, might spend many years upon it.

Through the splendid co-operation of a few growers we are beginning to see daylight, along the lines of cultivation and the supplying of humus, as indicated in our recent reports. Our experiments with poisons, which are numerous, are not yet concluded. I may state, however, that I am seeking a more satisfactory method of applying the poison than that outlined in Bulletin No. 4 of this station. I cannot advise the open furrow alongside the stools, because of the tendency to dry them out too much.

D1135 VS. GORU.

In a former report I called attention to the rooting systems of these two canes. I have been following the matter up, and have found every evidence of the superiority in the ratooning qualities of D1135. It is a cane that comes away with abundant shoots, and hence requires vigorous ratooning. It is well to slice right into the stool on each side, so that too many stalks will not develop and result in a grassy crop.

Mr. C. V. Hives, who is a man of recognised experience and ability, has called my attention to an interesting experiment which he has had with the two above varieties. He planted four rows of Goru down through the centre of a field of D1135. The first ratoons on this block were out last June; and after ratooning the second time he found that practically all the Goru died out entirely, while the D1135 is doing very well. Undoubtedly, this result is due to the character of the roots of the two canes.

In ratooning during dry weather Goru often succumbs, while under moist conditions it usually does well. I believe that this is due to the fact that the main roots, which are lateral, are broken off in ploughing and the stool dries out too much. This supposition is borne out by the fact that Goru which was not ploughed, on the same farm, is growing well.

Again, referring to the ratooning qualities of D1135, Mr. P. Wienert showed me one of his fields at Fishery Creek, which was planted with Badila in 1916; he supplied the misses, which were abundant, with D1135. At the time of my recent visit, practically all of the Badila had been killed out by the borer beetle, and the shoots of D1135 were very conspicuous because of their great vigour—none of them had suffered in the least from the pest.

PARASITES OF THE BORER BEETLE.

The tachinid parasites (*Ceromasia sphenophori*), referred to in my recent reports, have emerged splendidly in our cage at Gordonvale, where they have had our close attention; but those placed at Babinda and Moolaba have not fared so well; for on two occasions we found that ants (*Pheidole negacephala*) had got into the boxes of cane and were making their nests in the channels of the borers. We have no way of knowing, in these cases, whether the flies have escaped safely or not, and must wait for some months to see if they become established in those districts.

We feel rather confident of the result in our own district, because the flies were liberated from day to day, after they had mated in the large cage; and we sometimes saw them flying about in the borer-infested cane, which is alongside. They will have a good chance in this field, for it is not to be cut until the end of the season, and there is plenty of other cane near by.

BORER BEETLES, RATS, AND OWLS.

Let me call attention to the close relation existing between borer beetles and cane rats; and, further on, the value of barn owls in destroying these rodents.

It is a recognised fact that the borer beetles work along the lines of least resistance in depositing their eggs. If they find a split or hole in the rind of the cane they take advantage of it, for they are able to deposit their eggs more abundantly. The stalks chewed by rats are ideal locations for finding the young grubs of the borer, and for this reason let me urge that they should be discarded when cutting cane plants.

Let us recognise then that the destruction of the cane rat is an important step in the control of the borer beetle, where soft varieties are grown; and, again, that rats are more abundant in badly cultivated fields, especially those with weedy headlands. I think this may be accounted for by the fact that owls are unable to catch the rodents thus protected. When the headlands are clean the birds are able to discover their prey as the rats cross from one field to another.

My experience with the American Barn Owl (*Strix practicola*) will be of interest to those suffering from a pest of rats.

A pair of these birds had been nesting for some time on the top of a large, unused chimney of a school building. Upon examination I found that the chimney was almost filled with the cast-up pellets of the birds. Every bird student knows how the owl regurgitates the bones, hair, and so forth in a little pellet shortly after each meal. After raking these out of the chimney, they almost filled a two-bushel bag; and each one represented a rodent—identified by the skull, which was entire. I took the exhibit to a farmers' club, where it stirred up great enthusiasm for the protection of the owls.

I was pleased to learn from the literature here that Australia has four species of barn owls, and that one (*Strix delicatula*) was said to be common in North Queensland. Investigating the matter in the vicinity of the laboratory at night, I soon discovered a pair with several full-grown young. These birds have a call which is not unlike that of our American species. I can best imitate it by forcibly exhaling the breath between the tongue and teeth—a sort of rasping sound. They are very friendly, and come around the buildings at night, even perching on the water tank at the house when I gave their call.

This immediate region does not suffer from cane rats, and I do not doubt that these birds are doing their part to hold them in check.

MOTH PESTS.

Both the Army Worm (*Cirphis unipuncta*) and the Noctuid Moth Borer (*Phragmatiphila truncata*) are rather troublesome this season in places along the Mulgrave River. Fortunately, both species are attacked freely by parasites which keep them from becoming serious pests.

Every grower is familiar with the work of the army worm on young cane plants, the leaves being chipped out at the edges, and the caterpillar is usually to be found during the day hiding between the top leaves. The work of the noctuid moth borer, though less familiar, is easily recognised on young canes, for the central leaves are usually killed entirely, all the feeding being done inside the shoot. On old cane the caterpillars work behind the upper leaf-sheaths, boring into the stalks here and there; but their work may be easily recognised by the abundant frass that they throw out.

The caterpillars do not remain long inside the stalk, for a single individual may make a number of tunnels—evidently only going into them to feed and to hide during the day. The principal damage to mature cane is that they cause it to shoot freely at the eyes, due to the injury of the terminal bud.

I would suggest, as a possible control measure, the application of a green crop of beans or peas before planting cane again. This, however, would be of little avail if there were other infested fields of cane near by.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from the Field Assistant to the Bureau, Mr. J. C. Murray:—

During the month of August the districts of Nambour, Maryborough, Pialba, Childers, and Bundaberg have been visited, and as many farmers as possible called upon.

I find that in Nambour crushing has been proceeding since the 31st July. Prospects generally are fair, though the farmers seem to have suffered rather severely from the frost, although not so badly as at Bundaberg.

The principal varieties growing are D1135, N.G. 16, and H.Q. 285. Some farmers have small quantities of Purple Innis and Malagache, though the D1135 seems easily the best cane for this district. It has, however, a tendency to become thin and weak looking after the second ratoon crop.

Most of the land here has an acid reaction, as very little liming or green manuring has been done. Advice as to the best methods of getting results was eagerly sought after by the farmers, for, taking many things into consideration, they have had rather an uphill fight around Nambour.

The soil is rather hard to define. In some places it might be termed alluvial with a fair quantity of gravel, but a great deal of it is a heavy dark soil fairly rich in humus. The low-lying portions are not well drained.

No labour troubles have been experienced, most of the work being done by co-operation.

Cane farming around Maryborough appears to be declining. A good deal of 1900 Seedling is grown as well as D1135. Some of the farmers have a small quantity of Rappoe. The frost was fairly severe here; most of the cane is touched, though not severely, the tops only being damaged. Most of the farmers have a fair quantity of standover cane, principally D1135 for the Island. Plantation conditions are good. Soil conditions in Maryborough are very much the same as Nambour. Acidity in the soil is very pronounced. Conditions of labour are good as regards cane cutting.

Very few farmers volunteer ratoons, most of them burning the trash as the cane stands. The cane is peculiarly free from disease in this district.

At Pialba things are, from a farmer's point of view, discouraging. No frost has been experienced, but good results are not being obtained by the farmers. I consider this is due to lack of cultivation and neglecting to green manure and lime. Varieties of cane here are D1135, Black Java, 1900 Seedling. The same can be said here as regards acidity as of the other districts. The soil consists of a sandy loam with gravel and a heavy dark soil with a clayey subsoil. Some farmers are growing the Clark's Seedling, but of all the varieties the D1135 seems to do best. There are no local sources of lime around Pialba, most of the farmers dealing with the Degilbo Liming Company.

The Childers district, excepting that it is dry, looks very prosperous. The cane is untouched by the frost, and some of the 1900 Seedling is a picture. Nevertheless the land is becoming sour, and unless the farmers look to it they will very soon be getting poor crops.

There is a great deal of standover cane around Childers, due to the mills being idle during part of 1916. The soil here is a red volcanic, stony in places, and invariably, where cane is growing, has an acid reaction. The 1900 Seedling does better here than any other variety, although some of the Badila looks well. Clark's Seedling and D1135 show medium results. Rain is badly wanted in all the districts, and the cane planted in March will not make much of a showing, owing to the long spell of dry weather, unless rain falls soon.

Artificial drainage is hardly necessary around Childers, as most of the farms are on high land. Successful irrigation should be possible here.

Some trouble is being caused by the grubs, but if the land is kept clean and well cultivated the pest can be largely kept down.

Bundaberg is badly frosted, especially around Kalkie, Burnett Heads; Qunaba and Barolin have not suffered so severely as other places. Some growers have been using Mauritius Bean and cowpeas as a green manure, and the results are justifying the work done.

Badila and 1900 Seedling are making an excellent showing.

Animal Pathology.

IMPETIGO OF THE PIG.

By LIONEL B. BULL, B.V.Sc., South Australian Government Laboratory of Pathology and Bacteriology.

During the past two years a disease in young pigs has come under the notice of the staff of the Stock Department. Although the disease does not appear to have become very widespread there is some evidence to show that it is becoming more common. The disease appears to be more or less new to this State. It is characteristically a skin disease. It is found only in young animals, and usually appears at the age of two or three weeks, and rarely as late as ten weeks. It runs a more or less chronic course, but the mortality is usually very high, all the affected animals dying in most cases. Death occurs from one to three weeks after the first appearance of skin lesions. The disease is very contagious, and, depending upon the conditions, may affect every litter on a property.

At the request of the Chief Inspector of Stock the writer undertook an investigation into the nature and cause of the disease. The investigation was carried out in the field in collaboration with the Principal Veterinary Officer, Mr. C. V. Loxton, B.V.Sc., and in the laboratory. The following is a brief description of the results of the investigation:—

OCCURRENCE.

The disease has only been met with during the warmer months of the year.

AGE INCIDENCE.

Only young animals have been found affected. Although the whole of a litter may be severely affected, the mother has never been found to show any lesions whatsoever. The disease has been found most commonly in sucking pigs about two or three weeks old. Although the lesions may not appear until later than this, it is doubtful whether any case occurs after the tenth week.

SYMPTOMS.

The first sign of the disease is the appearance of small lesions in the skin. These are seen most commonly on the belly, behind the shoulder, on the thighs, and the under surface of the neck, although they may occur scattered irregularly over the body, head, and limbs. The lesion starts as a minute elevation in the skin, which rapidly enlarges, and takes a circular shape. The skin in the centre is roughened; the edges are usually sharply defined and rounded. The lesion is characteristically circular, raised, and discoid. The centre is at first denuded of the superficial layer of epithelium and covered by a crust. Later there is hypertrophy of the epithelium, with excessive keratinisation, a somewhat warty condition developing, which eventually covers the whole area except the edge, which is clean, raised, and rounded. The lesions vary in size from points just visible to the naked eye to areas of 15mm. ($\frac{3}{8}$ in.) in diameter, or even larger. Sometimes an area of congestion is seen surrounding the lesion.

There is rarely any discharge, but there is sometimes a slight oozing of a straw-coloured liquid, which rapidly dries on the surface. When the lesions are very numerous and crowded together a somewhat corrugated appearance is produced. Cracks may appear in or between the lesions in this case, and a purulent discharge (pus) develop.

At first the affected animals show little distress beyond a moderate pruritus or irritability of the skin. A little later they begin to lose condition, but this is not usually marked. They become less active, and show some shortness of breath. Usually a diarrhoea sets in, which lasts for a few days, when death occurs often quite suddenly, the tips of the ears and dependent parts becoming cyanosed (blue). Death occurs usually in from one to three weeks after the first appearance of the lesions.

In the more chronic cases the animals may become very emaciated before death. It is usual to find a mortality of 100 per cent. of affected animals, but some cases showing very few lesions may eventually recover. All of the cases observed have been found to harbor lice (*Haematopinus suis*), although not usually in great numbers.

POST-MORTEM APPEARANCES.

Apart from the typical skin lesions, there are usually well marked changes to be found in the internal organs. The same organs are not always attacked, and the appearances vary considerably in animals from the same litter, showing the same degree of infection—i.e., there is no typical *post-mortem* appearance to be found.

Thoracic Cavity.—The heart is usually found to be pale in colour and flabby. There are often areas of consolidation in the lungs (lobar pneumonia). Both lungs are usually affected, and the same lobes in either lung.

Abdominal Cavity.—The liver is large and usually mottled in appearance, and often showing on the surface numerous pin-point, whitish-coloured dots. The mottling is due to the occurrence of diffuse greyish-coloured areas. On section the greyish areas and small dots are seen to extend deeply into the substance of the organ, but are more frequent nearer the surface. The liver is usually paler than normal. The stomach is found to be normal; the small intestine is sometimes catarrhal. The kidneys usually show marked changes. On looking at the surface it is seen to be studded with petechial ("fleabite") hæmorrhages. On section these hæmorrhages are seen to extend throughout the cortex of the organ. At other times the kidney is seen to be intensely hæmorrhagic throughout. Sometimes the kidneys show no hæmorrhagic changes, but are much paler than normal. The spleen is usually large, but shows no marked changes. The mesenteric lymph glands are often very large and very hæmorrhagic. At other times they show the same change to a less degree. The superficial inguinal glands are often enlarged and hæmorrhagic.

BACTERIOLOGICAL EXAMINATION.

The majority of the animals examined have shown bacteria in the blood and tissues of the body. In most cases a bacillus giving the cultural and serological reactions of the *Bacillus enteritidis* (Gaertner) has been isolated from the blood and

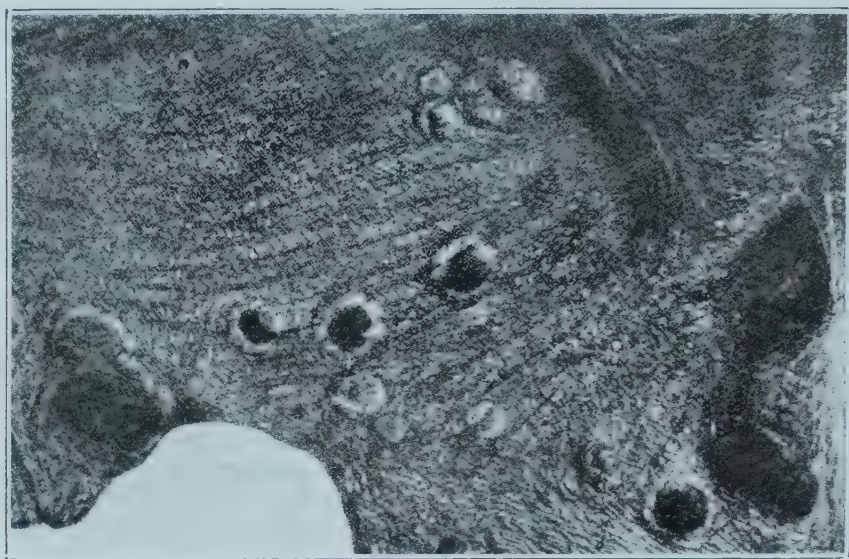


PLATE 39.

Photograph of the skin of an affected animal showing lesions in various stages of development. In the centre of the photograph are to be seen smaller lesions, typical in appearance, and showing distinctly the clean, raised edge. On the right side are to be seen two older lesions which have become fused. On the left hand side is to be seen one still older lesion. Note that the older and larger the lesion the less pronounced is the clean edge. (Photograph from a preserved specimen. Natural size.)

internal organs, and mixed with staphylococci and streptococci from the skin lesions. In other cases a streptococcus has been found associated with the *B. enteritidis* (Gaertner) in the blood and internal organs. In one mild case showing few skin lesions the blood and internal organs were found to be sterile.

In several cases the contents of the large bowel were examined for the presence of the *B. enteritidis* (Gaertner), but in no case was the micro-organism detected.

EXPERIMENTAL INVESTIGATION.

Four young pigs (Middle York) were taken from the mother and fed artificially. They were kept under observation for about a week, and as they remained healthy and developed normally, they were subjected to the following experiments:—

Experiment 1.—Lice (*Haematopinus suis*) were transferred from an affected animal to one of the experimental animals. About a week or ten days later characteristic lesions were found near the right shoulder, on the back, and on the belly. These lesions presented the characteristic appearances of lesions found in affected animals in the field. Bacteriological examination of the lesions revealed the presence of streptococci and staphylococci, but no bacilli. The animal was kept strictly isolated during the period of the experiment. Apart from the skin lesions the animal presented nothing abnormal. The lesions, which were few in number, gradually disappeared, no sign of them remaining six weeks after they were first observed.

Experiment 2.—An area of the skin along the belly of an experimental animal was lightly scarified and a skin lesion from an affected animal was rubbed into the spot. Nine days later small vesicles appeared on the area inoculated. These later took on the appearances characteristic of lesions found in naturally infected animals, although more crowded and not developing to the same size. The animal was kept strictly isolated during the period of the experiment. It showed no evidence of any ill-health, and gradually the skin lesions disappeared.

Experiment 3.—A young pig was inoculated subcutaneously with 3cc. of defibrinated blood collected from an animal showing very few skin lesions. This blood, on later examination, was found to be sterile. The animal was kept strictly isolated during the course of the experiment. It remained healthy and developed normally.

Experiment 4.—Two affected animals were kept in a pen for several days. The pen was purposely not cleaned during this time. The affected animals were removed and a healthy young pig placed in the pen. The animal was kept under observation for about two months. It remained healthy and developed normally.

DISCUSSION.

Although the investigation was necessarily somewhat limited in extent, and many points remain undetermined, it can reasonably be claimed that certain factors in relation to the disease have been elucidated. There seems to be no doubt that the disease is essentially a skin disease due to the inoculation of bacteria into the skin, where they grow and produce lesions with a very characteristic appearance. From the experimental observations and those carried out in the field it may reasonably be concluded that lice are responsible for this inoculation. Each lesion represents a separate inoculation of bacteria into the skin. When they are close together and numerous the lesions tend to fuse, but they always start as a minute elevation in the skin, which extends in a circular fashion.

There is no evidence to show that the skin becomes inoculated by any other means, although there is no reason to believe that this is not possible. Only the soft and tender skin of the young animal appears to be susceptible. The thicker and harder skin of the old animals appears to offer complete protection. That skin lesions are not the external manifestation of a systematic disease has been shown by the results of the experimental inoculations and the bacteriological examinations of affected animals.

Although a general infection results in the majority of cases, this appears to be due to the lowering of the resistance of the animal following the inflammatory trouble of the skin. Although the *Bacillus enteritidis* (Gaertner) is the micro-organism which is directly responsible for the serious condition and death of the animal, its presence is not essential for the production of the skin lesions. This is shown by the fact that the bacillus was not isolated from lesions produced experimentally. The skin lesions appear to be due to the inoculation into the skin of staphylococci and streptococci. Usually other micro-organisms are associated with these cocci, and may produce serious complications.

The *B. enteritidis* (Gaertner) and the streptococcus appear to be capable of invading the blood stream and internal organs after the resistance of the animal becomes lowered. This invasion probably takes place from the foci of infection in the skin. It has not been possible to determine whether the fatal termination of the disease depends directly upon the presence of *B. enteritidis*. The determination of this point is only possible after the investigation of many separate outbreaks. The opinion is held, however, that, given the absence of this bacillus, a milder type of disease would result, with few or no deaths.

PREVENTION.

Prevention of the disease should prove easy if sufficient care and attention are given to the management of young animals. They should always be kept in clean surroundings, where they can obtain a sufficiency of exercise in the fresh air and sunlight. A strict watch should be kept on adult and young animals for the appearance of any lice. Should any lice be detected, efficient methods for their eradication should be adopted.

Whenever lice are found on the animals their quarters should be thoroughly cleaned and disinfected. The animals themselves should be dipped, sprayed, or hand-dressed. A 2 to 4 per cent. creolin solution is useful for this purpose. A 10 per cent. kerosene solution is very efficient, but should not be used in the very hot weather, when it is liable to seriously injure the skin.

All treatments must be repeated at least three times at intervals of a week to ten days. The addition of creolin to hog wallows from time to time will be found to keep the animals comparatively free from lice. It is probable that, in the absence of lice, the disease will be absolutely unknown.—“Journal of Agriculture of South Australia.”

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR OCTOBER, 1918.

Article.							OCTOBER.	
							Prices.	
Bacon	...	...	...	...	...	lb.	9d. to 10d.	
Barley	...	...	...	...	...	bush.	4s. 9d.	
Bran	...	...	...	...	...	ton	£7 5s. to £7 10s.	
Broom Millet	...	...	...	...	...	"	£30 to £50	
Broom Millet (Sydney)	...	...	...	...	...	"	£40 to £50	
Butter (First Grade)	...	...	...	...	...	cwt.	149s. 4d.	
Chaff, Mixed	...	...	...	...	...	ton	£6 to £7 10s.	
Chaff, Oaten	...	...	...	...	...	"	£7 to £8 15s.	
Chaff, Lucerne	...	...	...	...	...	"	£12 to £14	
Chaff, Wheaten	...	...	...	...	...	"	£6 10s. to £7 10s.	
Cheese	...	...	...	...	...	lb.	11½d.	
Flour	...	...	...	...	...	ton	£12	
Hams	...	...	...	...	...	lb.	1s. 6d. to 2s.	
Hay, Lucerne	...	...	...	...	...	ton	£8 to £11 10s.	
Hay, Oaten	...	...	...	...	...	"	...
Hay, Wheaten	...	...	...	...	...	"	...
Honey	...	...	...	...	...	lb.	8d. to 9d.	
Maize	...	...	...	...	...	bush.	5s. 8d. to 5s. 9d.	
Oats	...	...	...	...	...	"	3s. 3d. to 4s.	
Onions	...	...	...	...	...	ton	£26 to £28	
Peanuts	...	...	...	...	...	lb.	8d. to 10d.	
Pollard	...	...	...	...	...	ton	£5	
Potatoes	...	...	...	...	...	"	£8 7s. 6d. to £12 10s.	
Potatoes (Sweet)	...	...	...	...	...	cwt.	4s. to 4s. 6d.	
Pumpkins (Table)	...	...	...	...	...	"	10s. to 12s.	
Pumpkins (Cattle)	...	...	...	...	...	ton	£12 10s. to £13 10s.	
Sugar-cane Fodder	...	...	...	...	...	"	55s.	
Eggs	...	...	...	...	...	doz.	8d. to 10½d.	
Fowls	...	...	...	...	...	per pair	4s. to 6s. 6d.	
Ducks, English	...	...	...	...	...	"	3s. 9d. to 4s.	
Ducks, Muscovy	...	...	...	...	...	"	3s. 6d. to 6s. 6d.	
Geese	...	...	...	...	...	"	8s. to 10s.	
Turkeys (Hens)	...	...	...	...	...	"	10s. to 13s.	
Turkeys (Gobblers)	...	...	...	...	...	"	18s. to 25s.	
Wheat (Milling)	...	...	...	...	...	bush.	4s. 6d. to 4s. 9d.	

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen boles	...	...	...	...	...	6s. to 10s.
Beans, per sugar-bag	...	...	...	...	...	10s. to 13s. 9d.
Beetroot, per dozen bunches	...	...	...	...	...	1s. to 2s.
Cabbages, per dozen	...	...	...	...	...	3s. to 15s.
Carrots, per dozen bunches	...	...	...	...	...	1s. to 2s.
Cauliflowers, per dozen	...	...	...	...	...	5s. to 10s.
Chokos, per quarter-case	...	...	...	...	...	...
Cucumbers, per dozen	...	...	...	...	...	1s. 6d. to 2s.
Lettuce, per dozen	...	...	...	...	...	9d. to 1s.
Marrows, per dozen	...	...	...	...	...	7s. 5d. to 10s.
Parsnips, per dozen bunches	...	...	...	...	...	1s. to 2s.
Peas, per sugar-bag	...	...	...	...	...	8s. to 13s.
Sweet Potatoes, per cwt.	...	...	...	...	...	1s. 6d. to 4s.
Table Pumpkins, per cwt.	...	...	...	...	...	10s. to 12s.
Tomatoes, per quarter-case	...	...	...	...	...	5s. to 8s.

SOUTHERN FRUIT MARKETS.

Article.	OCTOBER.	
	Prices.	
Bananas (Queensland), per case	10s. to 23s.
Bananas (Tweed River), per case	15s. to 19s.
Bananas (Fiji), per bunch	6s. to 8s. 6d.
Bananas (G.M.), per bunch	6s. to 8s.
Bananas (G.M.), per case	20s. to 22s.
Lemons, per bushel-case	4s. to 7s.
Mandarins, per bushel-case	18s.
Oranges (Navel), per bushel-case	14s. to 18s.
Oranges (Other), per case	8s.
Oranges (Queensland), per case	8s. to 10s.
Papaw Apples, (Queensland), per double-case	12s.
Passion Fruit, per half-case	10s. to 20s.
Pears, per bushel case
Pineapples (Queens), per double-case	8s. to 11s.
Pineapples (Ripleys), per double-case	6s. to 9s.
Pineapples (Common), per double-case	5s. to 8s.
Tomatoes, per half-case	2s. to 6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Apples, Eating, per case ...	...	10s. to 13s. 6d.
Apples, Cooking, per case ...	...	10s. to 12s. 6d.
Bananas (Cavendish), per dozen ...	...	2d. to 7d.
Bananas (Sugar), per dozen ...	...	2d. to 5d.
Cape Gooseberries, per quart ...	...	9d.
Citrons, per hundredweight ...	...	16s.
Cocoanuts, per sack ...	...	15s. to 25s.
Cumquats, per quarter-case ...	...	...
Custard Apples, per quarter-case ...	...	...
Lemons (Lisbon), per case ...	...	8s. to 12s.
Mandarins, per case ...	...	10s. to 15s.
Oranges (Navel), per case ...	...	...
Oranges (Seville), per hundredweight ...	...	12s.
Oranges (Other), per case ...	...	6s. to 10s.
Papaw Apples, per quarter-case ...	...	1s. to 2s. 6d.
Passion Fruit, per half-case ...	...	8s. to 10s.
Peanuts, per lb. ...	...	8d. to 10d.
Pineapples (Ripley), per dozen ...	...	1s. 6d. to 5s.
Pineapples (Rough), per dozen ...	...	1s. to 5s.
Pineapples (Smooth), per dozen ...	...	2s. to 3s. 6d.
Strawberries, per tray ...	...	1s. to 2s.
Strawberries, per dozen boxes ...	...	3s. 6d. to 9s.
Tomatoes, per quarter-case ...	...	5s. to 8s.

TOP PRICES, ENOGGERA YARDS, SEPTEMBER, 1918.

Animal.	SEPTEMBER.	
	Prices.	
Bullocks	£24 5s. to £29 2s. 6d.
Cows	£17 to £20 15s.
Merino Wethers	49s.
Crossbred Wethers	43s. 6d.
Merino Ewes	34s. 3d.
Crossbred Ewes	32s. 3d.
Lambs	31s. 3d.
Pigs (Bacon)	81s.
Pigs (Porkers)	41s.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF SEPTEMBER, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING SEPTEMBER, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Sept.	No. of Years' Records.	Sept., 1918.	Sept., 1917.		Sept.	No. of Years' Records.	Sept., 1918.	Sept., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	0·62	17	Nil	0·48	Nambour	2·54	22	3·46	5·30
Cairns	1·71	36	0·89	1·00	Nanango	2·01	36	1·30	7·11
Cardwell	1·45	46	0·81	1·12	Rockhampton ...	1·41	31	0·38	3·68
Cooktown	0·57	42	0·62	0·12	Woodford	2·24	31	0·98	4·14
Herberton	0·48	31	0·08	0·02					
Ingham	1·08	26	0·52	1·25					
Innisfail	3·63	37	2·65	2·51					
Mossman	1·08	10	...	1·18					
Townsville	0·79	47	0·19	0·23					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr	1·69	31	0·19	0·22	Dalby	1·85	48	0·60	5·82
Bowen	0·85	47	0·69	0·18	Emu Vale	2·06	...	Nil	7·02
Charters Towers ...	0·83	36	0·50	0·71	Jimbour	1·75	...	0·38	6·58
Mackay	1·54	47	0·53	0·70	Miles	1·53	33	0·38	5·92
Proserpine	2·18	15	0·37	1·45	Stanthorpe	2·56	45	0·33	7·28
St. Lawrence	1·38	47	0·61	2·59	Toowoomba	2·31	46	0·50	6·62
					Warwick	2·02	31	0·05	6·90
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1·84	...	0·29	4·51	Roma	1·65	44	0·24	7·25
Bundaberg	1·93	35	0·47	3·54					
Brisbane	2·09	67	1·98	5·21					
Childers	2·12	23	0·82	3·98					
Crohamhurst	2·53	25	3·45	5·81					
Esk	2·44	31	0·73	7·16					
Gayndah	1·64	47	0·26	5·28					
Gympie	2·18	48	2·95	3·57					
Glasshouse M'tains	2·24	10	1·55	5·60					
Kilkivan	1·82	39	0·07	4·17					
Maryborough	2·01	47	1·75	3·63					
					<i>State Farms, &c.</i>				
					Bungeworgorai ...	2·33	4	Nil	7·07
					Gatton College ...	1·87	...	0·52	7·50
					Gindie	0·95	...	0·51	3·57
					Hermitage	1·88	...	Nil	6·56
					Kairi	1·07	4	0·08	0·66
					Kamerunga	1·23	...	...	0·70
					Sugar Experiment Station, Mackay	1·40	...	0·46	0·60
					Warren	1·08	4	0·55	3·70

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for September this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

CLOSE SEASON FOR OPOSSUMS AND BEARS.

Trappers and shooters of bears and opossums should note that the season for their operations as far as opossums are concerned closed on 31st October. Persons, however, who killed up to that date will be permitted to remove the skins by rail up to and including 14th November. The close season for native bears remains in force until 30th April, 1919, and, therefore, the carriage of the skins of these animals is prohibited until that date.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.3	5.34	5.29	5.47	4.59	6.5	4.46	6.28	<div>PHASES OF THE MOON.</div> <div>The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.</div> <div>H. M.</div> <div>5 Sept. ● New Moon 8 44 p.m.</div> <div>14 „ ☾ First Quarter 1 3 a.m.</div> <div>20 „ ○ Full Moon 11 1 p.m.</div> <div>27 „ ☾ Last Quarter 2 39 p.m.</div> <div>The Moon will be farthest from the earth on the 8th, and nearest to it on the 21st.</div> <div>5 Oct. ● New Moon 1 5 p.m.</div> <div>13 „ ☾ First Quarter 3 0 p.m.</div> <div>20 „ ○ Full Moon 7 35 a.m.</div> <div>27 „ ☾ Last Quarter 3 35 a.m.</div> <div>The Moon will be farthest from the earth on the 6th, and nearest to it on the 20th.</div> <div>4 Nov. ● New Moon 7 2 a.m.</div> <div>12 „ ☾ First Quarter 2 46 a.m.</div> <div>18 „ ○ Full Moon 5 33 p.m.</div> <div>25 „ ☾ Last Quarter 8 25 p.m.</div> <div>The Moon will be farthest from the earth on the 2nd and 29th, and nearest on the 17th.</div> <div>4 Dec. ● New Moon 1 19 a.m.</div> <div>11 „ ☾ First Quarter 12 31 p.m.</div> <div>18 „ ○ Full Moon 5 18 a.m.</div> <div>25 „ ☾ Last Quarter 4 31 p.m.</div> <div>The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th.</div> <div>There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.</div>
2	6.2	5.34	5.27	5.47	4.58	6.5	4.46	6.28	
3	6.1	5.35	5.26	5.48	4.57	6.6	4.46	6.29	
4	6.0	5.35	5.25	5.48	4.56	6.7	4.46	6.30	
5	5.59	5.36	5.24	5.49	4.55	6.8	4.46	6.31	
6	5.58	5.36	5.22	5.50	4.54	6.9	4.46	6.32	
7	5.57	5.36	5.21	5.50	4.54	6.9	4.46	6.32	
8	5.56	5.37	5.20	5.51	4.53	6.10	4.46	6.33	
9	5.54	5.37	5.19	5.51	4.53	6.10	4.46	6.34	
10	5.53	5.38	5.18	5.52	4.52	6.11	4.47	6.35	
11	5.52	5.38	5.17	5.52	4.52	6.12	4.47	6.35	
12	5.51	5.39	5.16	5.52	4.51	6.13	4.47	6.36	
13	5.50	5.39	5.16	5.53	4.51	6.13	4.48	6.36	
14	5.49	5.40	5.15	5.53	4.50	6.14	4.48	6.37	
15	5.47	5.40	5.15	5.53	4.50	6.15	4.49	6.37	
16	5.46	5.41	5.14	5.54	4.49	6.16	4.49	6.38	
17	5.45	5.41	5.13	5.54	4.49	6.17	4.50	6.38	
18	5.44	5.41	5.12	5.55	4.48	6.17	4.50	6.39	
19	5.43	5.42	5.11	5.55	4.48	6.18	4.50	6.39	
20	5.42	5.42	5.10	5.56	4.48	6.19	4.51	6.40	
21	5.41	5.43	5.9	5.56	4.48	6.20	4.51	6.40	
22	5.40	5.43	5.8	5.57	4.47	6.21	4.52	6.41	
23	5.39	5.44	5.7	5.58	4.47	6.21	4.52	6.41	
24	5.37	5.44	5.7	5.58	4.47	6.22	4.53	6.42	
25	5.36	5.44	5.6	5.59	4.47	6.23	4.54	6.42	
26	5.35	5.45	5.5	5.59	4.46	6.24	4.54	6.43	
27	5.33	5.45	5.4	6.0	4.46	6.25	4.55	6.43	
28	5.32	5.46	5.3	6.1	4.46	6.25	4.55	6.44	
29	5.31	5.46	5.2	6.2	4.46	6.26	4.56	6.44	
30	5.30	5.46	5.1	6.3	4.46	6.27	4.56	6.45	
31	...	...	5.0	6.4	...	...	4.57	6.45

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during September, October, and November may be roughly arrived at by adding 16 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Orchard Notes for December.

THE SOUTHERN COAST DISTRICTS.

December is somewhat an off month for pines, though bananas should be improving both in quality and quantity. The purely tropical summer ripening fruits are not yet ready, and, consequently, there is only a limited supply of fruit in this part of Queensland during the month.

Early ripening varieties of grapes will mature, and care should be taken to market them in good order. The first fruit to ripen should be put up in small packages, as, if marketed in this manner, it will fetch a better price, but as it becomes more plentiful it can be packed in larger cases.

Pay particular attention during the month to all peaches, apples, pears, Japanese plums, or other fruits that are liable to be attacked by fruit fly, and see that no fly-infested fruits are allowed to lie about under the trees, and thus breed out a great crop of flies that will be ready to destroy the grape and mango crops as they mature.

If the month is dry, see that the orchard is kept well worked so as to retain moisture in the soil, and, in any case, even should there be a good rainfall, it is necessary to cultivate in order to keep down weed growth, as if weeds are not kept in check now there is little chance of their being kept in hand once the January and February rains set in.

The planting out of pineapples, bananas, and most kinds of tropical fruits can be carried out during the month, especially if there is any rainy weather; but, if the weather is dry, it is better to defer the planting out of tropical fruits till January or February.

The cyaniding of citrus trees can be continued when necessary, and where Maori or orange mite is showing it should be checked at once, as Maori fruit is of no use for the Southern markets, and is unsuitable for export to the old country.

THE TROPICAL COAST DISTRICTS.

Clean up all orchards and pineapple and banana plantations as long as you have the chance of fine weather, so as to have your land in good order when the wet season commences, as once the rain sets in there is little chance of fighting weeds. Watch bananas carefully for fly, and market the fruit in good order. Handle the crop of pines carefully; don't let the fruit get too ripe, as an over-ripe Northern pine is tasteless. The fruit should be cut as soon as it is fully grown, as even when quite green the rough-leaf varieties have usually developed sufficient sugar to suit most persons' taste. Pack carefully to prevent bruising, and they will carry South in good order.

Only send high-class mangoes South—bad-flavoured sorts, and stringy, carrotty, or turpentine flavoured varieties are not worth shipping. High-class fruit will pay to handle carefully, but there is no demand for rubbish, and I am sorry to say that fully 90 per cent. of the mangoes grown in the State must be classed under the latter heading.

Tropical fruits of all kinds can be set out during suitable weather. Fruit pests of all sorts must be systematically fought.

THE SOUTHERN AND CENTRAL TABLELANDS.

December is a busy month for the growers in the Stanthorpe district. Early apples, plums, peaches, nectarines, &c., will ripen during the month, and must be marketed as soon as ripe, as they do not keep long once they are gathered. Handle carefully, and grade better; there is far too much early rubbish dumped on to the local markets, which tends to spoil the demand as well as the price. Watch the orchards very carefully for codling moth and fruit fly, and take every possible precaution to keep these pests in check should they make their appearance, as the future cleanliness of the orchard depends very largely on the care that is taken now to keep these pests in check.

If the month is dry, keep the orchard and vineyard well cultivated. Watch the vines carefully so as to detect the first signs of Oidium or Anthracnose, and systematically fight these pests, remembering always that in their case prevention is better than cure, and that only prompt action is of the slightest value.

On the Darling Downs every care must be taken to keep the fruit-fly in check, and on no account must infested fruit be allowed to lie about under the trees, as this is far and away the best method of propagating the pest wholesale.

In the Central District the grape crop will ripen during the month. Handle the fruit carefully. Cut it when dry, and where it has to be sent long distances to market pack in 6-lb. baskets rather than in larger cases. Where dry keep the orchard and vineyard well cultivated, and where the citrus and other fruit trees require it give them an irrigation. Don't irrigate grapes once the seeds have been formed, as it tends to deteriorate the quality, and to make the fruit tender and consequently to carry badly.

Farm and Garden Notes for December.

Too much care can scarcely be bestowed upon potatoes dug up this month to protect them from the sun. They should be dug or ploughed out as soon as the skin is firm, as they are liable to rot in the ground owing to the great heat.

FIELD.—The wheat harvest will be now nearing completion. The estimates of the probable yield have varied so considerably that it will be well to wait until the entire harvest is over before speculating on the result. This State is a long way from becoming a wheat-exporting country. The principal factor operating against a still greater extension of the wheatgrowing industry is that many farmers who formerly grew wheat and barley have turned their attention to dairying, which offers larger and quicker returns.

Given favourable weather, maize, panicum, imphee, kafir corn, and the various millets may be sown.

Cotton sown in October and November will be making headway but slowly, owing to the lack of September and October rains. Keep down all weed growth by scarifying as long as the growth will admit of horse work. Tree cottons, such as Sea Island and Caravonica, should be topped and pruned.

KITCHEN GARDEN.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered, otherwise the plants will leave off bearing. Seeds of all these may be sown for a succession. Sow cabbage and cauliflower seed. Great difficulty will be experienced in getting these to grow at this season, and the plants will consequently be more valuable in proportion. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Take up onions, and spread them out thinly on the barn floor until the tops wither sufficiently to pull off easily. They should then be graded into sizes, and sent to market or stored in a cool place. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown. All vacant ground should be well manured and dug two spits deep. Manure and dig as the crops come off, and the land will be ready for use after the first shower.

FLOWER GARDEN.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a "hard pan," or caked surface, beneath the loose soil. Alternate light with deep hoeings. A few annuals may still be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulaca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and, as the flower buds develop, give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top-dress all lawns.

GOVERNMENT AGRICULTURAL LABORATORY.

INSTRUCTIONS FOR THE COLLECTION OF SAMPLES, AND
SCALE OF FEES.

GENERAL INSTRUCTIONS.

1. All analyses will be carried out in the order in which the samples are received at the Laboratory, with the exception of perishable substances, which will be analysed immediately after arrival.

2. Should any person wish for an immediate analysis, the fee, charged in accordance with the scale of fees below, will be increased by 50 per cent.

3. The samples may be forwarded by parcel post or by rail, carriage paid, to the

Under Secretary for Agriculture and Stock, Brisbane.

In all cases a letter, giving full instructions as to the information required, and enclosing the prescribed fee, must be sent at the same time.

4. Analyses will only be carried out if these instructions are adhered to, and if the samples are taken in accordance with further instructions issued below.

5. The Under Secretary may, under special circumstances, modify the fees charged for analytical work.

SCALE OF FEES.			For Farmers, &c.*		
	£	s. d.	£	s. d.	
Butter, Cheese, Condensed Milk—commercial analysis ..	1	1 0			
Butter, Cheese, Condensed Milk—complete analysis ..	2	2 0			
Butter, Cheese—Estimation of boric acid, or moisture ..	0	5 0			
Cream and Milk—Estimation of fat only	0	5 0	0	2 6	
Cream and Milk—Estimation of fat, total solids, and test for preservatives	1	1 0			
Dipping Solutions, prickly-pear destroyers—test for arsenic only	0	10 6			free†
Fertilisers—Determination only of—					
Lime	0	10 0	0	3 0	
Nitrogen, total nitrogen, nitrate nitrogen, ammonia salts, or otherwise (each)	0	12 6	0	3 0	
Phosphoric acid—water soluble, citric acid soluble, or total phosphoric acid (each)	0	15 0	0	3 0	
Potash	0	15 0	0	3 0	
Fat	0	10 0	0	3 0	
Degree of fineness	0	10 0	0	3 0	
Analysis of—					
Blood manure, or dried blood	0	15 0	0	3 0	
Bone dust, or bone meal	1	10 0	0	6 0	
Guano, rock phosphates	2	0 0	0	10 6	

* Reduced fees apply only to such residents in Queensland whose main source of income is from agricultural, pastoral, and horticultural pursuits.

† Dipping fluids are analysed free of charge for the owners of all registered dips.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. X.

DECEMBER, 1918.

PART 6.

Agriculture.

THE ELECTRIFICATION OF SEEDS.

The following article from an English paper will doubtless be interesting to some of our readers. The electrifying of seeds of wheat has for some years engaged the attention of scientific agriculturists in Europe, and lately some remarkable results have been recorded, as here stated. The process has now reached a crucial stage.

Begun half a dozen years ago in a few pots, it was next extended to a plot of garden ground. In the following season a couple of farmers grudgingly gave up to it a few small plots of agricultural land. Surprised by the result, they and one or two more tried it the next season on a few acres. Again the result was encouraging, and more farmers sowed the seed upon larger acreages. The results were of such a character that the news spread far and wide, and at the present time more than 2,000 acres of corn grown from electrified seed are waiting to be harvested.

A number of representatives of foreign and colonial Governments and agricultural experts have visited many of the farms in Dorset on which electrified and unelectrified seeds of the same sample are growing side by side in the same fields, and this is what they saw. A square yard of electrified wheat was measured off by Captain Rawlence, a professional surveyor, in the presence of the visitors, and in their presence reaped and tied up in a sheaf. Another square yard of unelectrified wheat growing in the same field was then treated in the same way. The two sheaves were taken into Dorchester by the visitors and there weighed in their presence, and it was found that the unelectrified sheaf weighed $4\frac{1}{2}$ lb.; the electrified sheaf $7\frac{1}{4}$ lb.

In every case the straw growing from the electrified seed was longer by some inches than the straw growing from the untreated seed. In every case the ears of the electrified wheat and barley were longer, plumper, and appeared to contain more berries or seeds than the unelectrified, the heads of the oats were larger, and the florets more numerous. In some fields in which the untreated corn had been laid in patches by recent thunder showers, the whole of the electrified corn was standing upright, the straw being not only longer but stouter.

Experienced agriculturists estimated the increase of yield of the electrified crops at from two to three sacks per acre. An increase of two sacks per acre on an average crop of wheat would be 25 per cent. In 1915, rather more than two million tons of wheat were produced in the United Kingdom. If the electrifying process

should be universally adopted it seems that the quantity produced would be increased by half a million tons, that the food of the country and the wealth of the farmers would be increased by this amount, that half a million tons of freight and many more tons of shipping would be saved on wheat alone. The result of the thrashing should be interesting.

THE COTTON CROP OF 1918.

That cotton-growers in 1916 were satisfied with the returns from their crops, is evidenced by the fact that, whereas in that year only 75 acres were under cotton cultivation, the following year saw 133 acres planted. The area sown in 1918 does not appear in the report of the Government Statistician, which only supplies returns to December, 1917. In the two seasons mentioned the respective returns of seed cotton were given as 24,264 lb. and 76,656 lb. respectively. The quantity of seed cotton delivered by farmers at the departmental ginnery in 1918 amounted to 166,458 lb., which produced 54,280 lb. of lint, or, approximately, the proportion of lint was one-third the weight of the seed cotton. The whole of the ginned cotton was sold at 1s. 1d. per lb. except only a small portion of second grade. The farmers received, on delivery of their crop, an advance of 2d. per lb. The price obtained for the lint enabled the payment of a further 2d. per lb., making the total payment for raw cotton at the farm 4d. per lb. The Department had, however, since the previous year, installed a "Linter" machine, by which means the short lint remaining on the seed of Upland cotton was saved to the extent of between 2½ and 3½ per cent. This may enable the Department to pay a little more to the suppliers.

In the old days of cotton-growing in the State, the gin houses paid 3d. per lb. to the growers, and a glance at the records of the return of a cotton crop to farmers will show that, at that price, this crop paid far better than any other. Certainly wages in the old days were considerably lower than at present but, as of old, many farmers keep the picking (valued at ½d. per lb.) in their own families, thus equalising expenses, and increasing the value of the crop.

A fair crop of seed cotton is 1,000 lb. per acre, but in the Moreton districts, far larger yields have been obtained (up to 2,000 lb.), and the net return ranged from £5 16s. 10d. to £15 3s. 3d. per acre. The results of the 1918 crop go to show that a cotton field large or small will return to the farmer more than any other crop, and with less labour.

MARKET GARDENING.

WHEN TO PICK TOMATOES.

It is not generally known that tomatoes ripen and colour from within outward. The fruits will acquire a perfect colour if they are picked as soon as they have grown to full size. They should be spread out in the sunshine for a time. When the surface colour begins to change from a dark green to a distinctly lighter shade with a very little tinge of pink, the fruit may be picked. Such fruit, if wrapped carefully in paper, will carry long distances, and ripen during the journey, opening up almost perfect.

One who has only a few plants may secure beautiful fruits free from cracks and of splendid colour by enclosing the fruits in paper bags some weeks before they ripen.

Tomatoes only acquire their most perfect flavour when ripened on the vine in full sunlight. No fruit artificially ripened is equal to that ripened by the sun.

It requires a great deal of experience to know exactly when to pick tomatoes. Fruit that has to be sent on a long journey must be gathered before that which has only a short distance to travel. Generally speaking, the fruit should be left on the vine no longer than will permit of its becoming fully ripe by the time it reaches its destination, where it is exposed for sale. When the fruit is to be shipped any distance frequent pickings are necessary to secure the fruit in the right condition. When the markets are close it is always an advantage not to gather until the fruit

is well coloured and before it begins to soften. Great care must be taken not to mark or bruise the fruit. Care should be taken to grade the fruit and so make it more attractive for sale. It should be graded as to size, shape, and colour. It will always pay to grade the fruit carefully. Careful grading and packing have great influence on the price. In our State very little care is taken with tomatoes. We see the fruit exposed for sale in the barrows, hand carts, and elsewhere; no attempt being made to make the fruit attractive.

When ripe, tomatoes require most careful handling, as they are easily bruised when roughly treated. It is not uncommon to see boxes of fruit most roughly handled in the market, and emptied from case to case as if they were as hard as stones. No wonder they have lost their flavour before reaching the consumer. Australians have a lot to learn about marketing fruit.

Tomato Weevil.—These little creatures attack the tomato plants at night. The weevil belongs to the same family as the curculio. It does much damage both in the grub and beetle stages. It feeds on the leaves at night and hides in the soil during the day. It is an easy matter to catch the grub. Spread a sheet under the plants, then let the bright light of a lantern shine on the plant; the weevils immediately fall on the sheet and are easily killed. Some people get success by making a bait of arsenic and bran. This is spread near the base of the plants. Don't allow chickens to have the run of the garden while the baits are about.

Cut Worms.—These do considerable damage to young tomato plants. The best remedy is a poisoned bait made thus: 1 lb. of arsenic, 1 lb. sugar, 6 lb. of bran. Mix with enough water and make a mash. Spread this about the base of the plants.

A solution of arsenate of lead to 50 gallons of water, when sprayed on the foliage, will kill all leaf-eating beetles and grubs.

Cracking of the Fruit.—Cracks and fissures in the mature fruit are due to variations in water supply. Some varieties are very liable to this disease. The grower should cultivate thoroughly and so prevent sudden checks in growth. If the development of the fruit has been checked by dry weather conditions and abundant supply of water follows, the outer skin cannot keep pace with the expanding fruit, and so cracking ensues.—“Garden and Field.”

VARIOUS MANURES FOR ROSES.

Whatever other manures you choose to apply you must use cow manure, if possible, well decayed and lightly pointed into the soil after you have pruned them in spring. Plenty of this should, of course, have been worked into the ground before planting them. Cow manure is slower in its action and cooler than horse manure. Pig manure is a good substitute for cow manure, being similar in its action. At the same time it is well to note that manure from well fed dairy cows is better than that from cattle getting less rich food. If fresh it should be thrown up loosely in a heap to ferment for a week and turned at least twice during that time. Cow manure contains nitrogen, phosphoric acid, and potash. Mechanically it helps the soil to retain moisture in summer, and this is of great importance to roses. Bone manure, if good, supplies phosphoric acid and a small percentage of nitrogen. One-inch bones may be applied to the soil at planting time, but these are very slow and lasting. For more immediate use top-dress with bone meal. Superphosphate of lime may be applied in spring after pruning and lightly pointed into the ground. You may use it at the rate of two to three pounds per rod. It is quicker in its action than bone meal. The above artificial manures supply phosphoric acid, and basic slag is another of the same type. It may be applied in autumn. Potash may most profitably be applied to light soil. Some of this will be contained in farmyard manure, also in urine from cow houses and from manure heaps. Wood ashes also supply it, and this may be given in spring. Nitrogen is also a valuable manure and serves to encourage the growth of wood and foliage. It may be applied at the rate of $\frac{1}{4}$ oz. to the gallon of water at intervals of three weeks from the time the roses commence growing until the buds commence to open. Soot water supplies a little nitrogen in the form of ammonia and gives good colour to the foliage. Potash is valuable in the manufacture of starch in the foliage. Lime may be applied with advantage in heavy soils, but not at frequent intervals. Lime rubble would be less active and would answer the purpose. Marl is a slow-acting form of lime. For the purpose of food a sufficient amount of lime will usually be found in superphosphate and the various forms of bone manure. Most soils contain all of the elements of plant food in sufficient quantity, with the exception of phosphorus, potash, nitrogen, and occasionally lime. If you desire to get more growth of wood and leaves then apply some of those manures which contain nitrogen.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The Office of the Secretary of the undermentioned Herd Book Societies is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson ..	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane ..	Paringa Farm, near Cairns	5	21	Do.
John Anderson ..	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS— <i>continued.</i>				
JERSEYS— <i>continued.</i>				
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Jersey Herd Book of Queensland
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin ..	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi ..	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book

GUERNSEYS.

Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia
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HOLSTEINS.

Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman ..	"St. Athan," Wyreema	12	47	Do.
F. G. C. Gratton ..	"Fowlerton," Kingsthorpe	1	15	Do.
R. S. Alexander ..	Glenomond Farm, Coolumboola	1	3	Do.
Ditto	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings ..	St. Gwithian, Toogooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff ..	Inavale Stud Farm, Bunjgurgan, Q.	3	9	Do.
E. Swayne	West Plane Creek, Mackay	1	2	Do.

ILLAWARRA.

A. Pickels	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	Ramsay	2	22	Do.
Hunt Bros.	Springdale, Maleny ..	3	62	Do.

MILKING SHORTHORNS.

P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	Torran's Vale, Lane-field	1	9	Do.
W. Middleton ..	Devon Court, Crow's Nest	3	27	Do.
A. K. Yorksten ..	"Dunure," Miles ..	2	8	Do.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
BEEF BREEDS.				
SHORTHORNS.				
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan ..	"Arubial," Condamine	3	6	Do.
W. B. Slade ..	E. Glengallan, Warwick	2	20	Do.
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

In future, the list of Breeders of Pure-bred Stock, hitherto published in the monthly issues of the Journal, will appear half-yearly only—namely, in June and December.

FARMERS' WOOL CLIP.

PREPARATION OF WOOL CLIPS FOR MARKET—No. 2.

By R. WILSON, Assistant Instructor in Sheep and Wool.

(Continued from November issue.)

The reason for branding the bales in this way is that the packs may be used again, and if disfigured by a large brand on the side they have to be returned to owner as second-hand, when new packs would be charged for.

The advantages to the farmer are many:—

- (a) Minimum rate of commission, $1\frac{1}{4}$ per cent., which would not be obtained unless in lots whose value is £500 and over.
- (b) Classification charges are at the rate of 10s. per bale (average weight), being apportioned according to the size of parcels.
- (c) Handling and other charges are reduced to a minimum.

The clips that are now handled by the Department would previously be sold in unattractive parcels of bales, butts, and bags that were, before the appraisement system, wholly bought by dealers and others, who reclassified and resold at a profit. I have a fair idea of that business as I was, at one time, employed as foreman to one of those firms. The farmer lost that profit. Hereunder is shown a typical submission sheet of six farmers' clips, showing the different classes and how the farmers receive their full values in the various grades.

The Department wishes to give the farmer every assistance in obtaining the best value for the product grown by him by putting the wool on the market in attractive and even lines, thereby encouraging the small owner and mixed farmer in sheep breeding, which has become a very profitable business.

PREPARATION OF WOOL CLIP FOR MARKET.—No. 3.

MERINO CLASSING—STATION AND FARMERS.

The system to follow in classing Merino wool is to class mainly to—(a) Length and soundness; (b) yield; (c) general characteristics, viz., colour, style, vegetable, earth or other foreign matter contained therein.

In the majority of cases, five to seven sorts will be found sufficient for a station of about 40,000 and upwards, and the sorts should be as follows:—First combing, second combing, first clothing, second clothing, AA fleece, A fleece, cast sort.

First Combing should contain the sound, light-conditioned wool of good length, full, bold, staple, and attractive looking wool of good colour.

Second Combing includes the sound, generous-conditioned, lean-stapled, duller fleeces of good length contained in the clip.

First Clothing contains the fine, soft, light-conditioned short wool of the clip.

Second Clothing, the rougher, heavier, duller, and less attractive-looking short wool.

In regard to the grading of clothing wools, fineness to a certain extent must come in.

Fineness plays a more important part than in the combing sorts, and in regard to this type of wool, a wool may be very thin-stapled, and yet show exceptional quality and fineness, which would constitute an ideal clothing wool; because quality, and fineness are two of the most strongly marked indications of a good felting wool.

AA Fleece would contain fleeces presenting similar features to the first combing, with the exception that it would be unsound; that is, having a tendency to break when tension is applied to a staple drawn from the fleece.

A Fleece to contain fleeces similar to the second combing, but unsound.

Cast Sort would comprise any rough, coarse, matted, very heavy-conditioned, dingy, or any badly bred fleeces.

If there were sufficient wool that carried a great amount of condition, another sort could then be made for wool-carrying condition only, as that class of wool would be too good to mix with a matted or dingy fleece. The difference between the two wools being that the heavy-conditioned wool will wash up a good, bright colour, while the dingy wool will never wash up bright in colour. Generally speaking, it is not necessary to make a condition sort for there is often not a sufficient quantity of that particular line in a clip.

Rams' wool should be packed by itself.

Black wool should be packed by itself.

FARMERS' LOTS.

In the classing of small clips, or farmers' lots, it is not necessary to go into very scientific classing, as the main idea for every small man to consider is to class his clip into even lines, and, at the same time, make as few sorts as possible.

Supposing he has 1,000 sheep, mostly Merino, the best method would be to make two (or, in isolated cases, three) sorts at most.

They would comprise the following:—

AAA—All long, sound, medium to light conditioned wool.

AA—Short, thin-stapled, fine wool of fair condition.

A—Heavy-conditioned wool of dull colour.

There would be very little of the latter quality, as the bulk of the clip would go into the two first lines.

In a clip you generally have a few badly-bred, matted, or very heavy-conditioned fleeces that will not match your bulk lines.

Rather than put low quality wool in your good, even lines, thereby making them irregular and lowering the value, it would pay to put it into a lower grade than it really is, such as pieces, &c., where it may help that line up instead of bringing the good lines down in quality.

In packing the wool for market, good, honest packing always pays. Thoroughly trained experts are employed to value wool, and they can detect "topping up" at once, when the farmer suffers, as he is allowed such a price that the buyer would not lose, should the bale turn out to be worse than it appears when valued. Cross-bred wool should always be packed separate from Merino, and if packing unskirted, it is always advisable to remove any stained wool, rough points, or fatty edges.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, OCTOBER, 1918.

Very hot days, dust storms, and hot winds have been prevalent during the month. The scarcity of green feed is badly felt by the birds, and this, together with the removal of some of the pens, has caused a considerable drop in the number of eggs obtained. The heavy breeds that have been transferred have not taken to their new quarters at all well. The laying in these pens has not stopped altogether, but is very uneven. The opposite is the case with the light breeds removed. E. Chester's pen was moved at the commencement of September, attained the highest score for that month, and has repeated the performance during October. The following pens were moved last month:—Mrs. Hunter's Messrs. Becker, E. Chester, Taylor, Marson, Quinn's Post Poultry Farm, and Mrs. Coomber's. At the commencement of this month (October) the following were transferred:—Messrs. Macrae, W. Smith, Claussen, Lyell and Dr. Jennings. On the 20th October, Messrs. Burns, Morris, Fulton, and the Nobby Poultry Farm pens were removed. The following cases of broodiness were recorded in the heavy section:—Macrae (1), W. Smith (1), Reilly (5), Dennis (1), Mars Poultry Farm (1), Walters (5), Morris (2), Burns (1), Fulton (1), Larsen (2), Fitzpatrick (1), Hindley (1), Puff (3), Mee (4), Shanks (1), Lutze (2). In light breeds—Prince (2), Knoblauch (1), Howard (1), Porter (1), Zahl (1). The following have lost birds by death:—Puff, Trapp, and Fraser. Several birds have required treatment for sickness, mostly blood troubles and bowel cases.

TRUENESS TO TYPE.

The College True to Type prizes are given for the purpose of stimulating interest among breeders in maintaining a closer approximation to the standard type in the various breeds. On this account the pens of the various competitors have been judged fairly rigidly, with the results shown below. The standard adopted for entry into the general competition is not sufficiently rigid to render all birds entered eligible for the true to type prizes. The classification of the competing pens is as follows:—Class I. have passed, having answered all requirements in regard to trueness to type. Class II. have passed, but have faults which need rectifying in future breeding. These faults will be found in the full detailed report on the subject, to be published in November issue of the Queensland Agricultural Journal. Class III. possesses faults which will, in most cases, pass them out in the next competition (1919-20), and the breeders must take drastic measures to improve, otherwise such birds will not be accepted in future competitions. The current competition will admit the class. Class IV. altogether fail to comply with our requirements, and are consequently passed out.

The following are the individual records, with classification:—

Competitors.	Class.	Breed.	Oct.	Total.
LIGHT BREEDS.				
*Dixie Egg Plant	II.	White Leghorns ...	140	1,005
*E. Chester	III.	Do.	145	931
*G. W. Hindes	I.	Do.	144	914
*Geo. Howard	I.	Do.	125	885
*C. P. Buchanan	II.	Do.	131	870
*Geo. Prince	III.	Do.	130	867
G. H. Turner	III.	Do.	137	858
*T. Fanning	I.	Do.	133	855
*C. Knoblauch	III.	Do.	112	852
*W. Becker	III.	Do.	141	852
Mrs. L. Henderson	I.	Do.	136	841
*W. Lyell	II.	Do.	125	826
*E. A. Smith	II.	Do.	136	816
*Oakland Poultry Farm ...	III.	Do.	133	814
*R. Holmes	II.	Do.	115	813
*L. G. Innes	II.	Do.	129	809
*O.K. Poultry Yards	IV.	Do.	117	781
B. Caswell	I.	Do.	122	775
*Quinn's Post Poultry Farm ...	II.	Do.	135	774
*Dr. E. C. Jennings	IV.	Do.	126	766
*Range Poultry Farm	II.	Do.	126	747
J. J. Davies	I.	Do.	119	739
*Mrs. A. T. Coomber	II.	Do.	130	723
*Thos. Taylor	II.	Do.	112	722
*Chris. Porter	III.	Do.	94	708
Harold Fraser	III.	Do.	106	707
*Homalayan Poultry Farm ...	II.	White Leghorns ...	135	699
*J. M. Manson	II.	Do.	119	698
*J. Zahl	IV.	Do.	115	687
O. W. J. Whitman	III.	Do.	84	674
Mrs. L. F. Anderson	II.	Do.	127	661
*T. B. Hawkins	II.	Do.	110	643
*Mrs. R. Hunter	II.	Do.	133	640
R. T. G. Carey	IV.	Do.	88	640
*J. W. Newton	II.	Do.	128	636
Mrs. A. G. Kurth	II.	Do.	131	635
S. Wilkinson	IV.	Do.	115	624
H. B. Stephens	II.	Do.	124	614
G. Williams	II.	Do.	96	603
Shaw and Stevenson	I.	Black Leghorns ...	117	602
Geo. Trapp	I.	White Leghorns ...	104	592
H. F. Britten	I.	Do.	116	591
Progressive Poultry Pens ...	I.	Do.	121	579
B. Chester	II.	Do.	116	555
P. O. Oldham	I.	Do.	119	553
W. A. Wilson	II.	Do.	115	522
A. W. Walker	I.	Do.	123	517
HEAVY BREEDS.				
*Nobby Poultry Farm	II.	Black Orpingtons ...	105	902
*E. F. Dennis	IV.	Do.	126	809
*A. E. Walters	I.	Do.	110	801
*E. Morris	III.	Do.	105	786
T. Hindley	II.	Do.	113	778
*D. Fulton	II.	Do.	133	769
*Mars Poultry Farm	II.	Do.	131	757
*R. Burns	III.	Do.	120	756
*W. H. Reilly	II.	Chinese Langshans ...	110	707
*W. Smith	I.	Black Orpingtons ...	68	688
A. Shanks	I.	Do.	118	675

EGG-LAYING COMPETITION—*continued.*

Competitors.	Class.	Breed.	Oct.	Total.
HEAVY BREEDS— <i>continued.</i>				
E. M. Larsen	II.	Black Orpingtons ...	94	673
*J. W. Macrae	II.	Do.	55	659
T. W. Lutze	II.	Do.	116	610
W. J. Mee	IV.	Do.	68	548
*F. A. Claussen	I.	Rhode Island Reds ...	71	541
H. Puff	I.	Do.	92	487
Jas. Fitzpatrick	I.	Do.	93	462
Totals ... ..	...	...	7,563	46,613

* Indicates that the pen is engaged in the single hen test.

RESULTS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	157	162	180	155	170	181	1,005
E. Chester	158	157	146	176	147	147	931
G. W. Hindes	185	153	142	154	146	134	914
Geo. Howard	139	148	146	153	147	152	885
C. P. Buchanan	133	145	148	148	155	141	870
Geo. Prince	124	160	146	151	138	148	867
G. H. Turner	91	123	157	156	181	149	858
T. Fanning	153	133	158	108	154	149	855
C. Knoblauch	144	132	158	136	135	147	852
W. Becker	144	146	123	157	129	153	852
Mrs. L. Henderson	149	126	141	109	158	158	841
W. Lyell	142	148	147	132	127	130	826
E. A. Smith	114	157	140	149	141	115	816
Oakland Poultry Farm	123	133	150	151	132	125	814
R. Holmes	148	150	129	132	118	136	813
L. G. Innes	144	159	172	89	99	146	809
O.K. Poultry Yards	124	141	145	115	139	117	781
Dr. E. C. Jennings	116	157	139	118	132	104	766
Quinn's Post Poultry Farm	162	112	122	110	155	113	774
Range Poultry Farm	47	161	107	138	142	152	747
C. Porter	92	122	136	117	109	132	708
Thos. Taylor	93	136	125	110	126	132	722
Mrs. A. T. Coomber	110	136	119	126	92	140	723
J. Zahl	146	113	136	130	98	64	687
J. M. Manson	148	132	148	87	75	98	688
Homalayan Poultry Farm	144	122	103	95	132	103	699
T. B. Hawkins	131	103	134	90	90	95	643
J. W. Newton	119	150	66	92	116	93	636
Mrs. R. Hunter	102	138	52	103	121	124	640
HEAVY BREEDS.							
Nobby Poultry Farm	171	151	136	113	160	171	902
A. E. Walters	118	160	98	157	160	108	801
E. F. Dennis	161	127	125	77	175	144	809
E. Morris	116	124	149	156	138	103	786
R. Burns	118	132	105	115	158	128	756
D. Fulton	148	122	122	119	80	178	769
Mars Poultry Farm	135	144	118	130	115	115	757
W. Smith	166	121	54	122	101	124	688
J. W. Macrae	75	33	134	100	127	140	659
W. H. Reilly	123	143	122	74	111	134	707
F. A. Claussen	99	96	82	101	105	58	541

GENERAL COMMENTS ON "TRUENESS TO TYPE," COMPETITION BIRDS.

Light Breeds.—The improvement in type of the birds competing in the current competition is small in comparison with the 1917-18 contest. In classifying the pens, the standard of the utility poultry breeders has not been strictly adhered to, and a good deal of leniency has been shown in connection with the English Poultry Club standards. There are a few pens of exceptional quality, and it is very gratifying to be able to say that these same pens have, in nearly every instance, given a satisfactory account of themselves. The type of the birds in the six-hen test, which are for the most part owned by beginners in competition work, is much better than the type of those owned by the majority of the old hands, and new men in the singles have in most cases forwarded good specimens. In our opinion, the pen owned by G. W. Hindes is almost ideal for utility work, and possesses every feature that marks them as Leghorns. They have size without coarseness, are very uniform, with typical Leghorn bodies, and perfect headpieces. They also possess stamina which no change in weather or conditions seems to shake. This, in our opinion, is half the battle in competition work. This same pen has passed the weight of egg test, and takes the third place for number of eggs produced. It is, therefore, plainly proved that close conformity to the English standard weight and number of eggs can be obtained by some breeders. It is therefore intended to adopt more stringent measures each year, allowing ample time for competitors to make the necessary improvements in their stock. The lack of uniformity in some of the pens spoils their whole appearance. Several pens are completely spoilt, and consequently graded lower, owing to one or two individuals being dwarfed. The Homalayan P. Farm's F bird in the single test is about the most typical bird in the competition, yet the pen is graded second class owing to the absence of uniformity. There are a goodly number of Leghorns with very diminutive combs. Taken for granted that the comb calls for a certain amount of upkeep, the larger it is the bigger the drain on the bird's system, a Leghorn without the neatly serrated, fine-textured comb hanging gracefully on one side has the appearance of anything other than a Leghorn, especially if the medium comb is in conjunction with small size or discoloured lobes. Tail-carriage in Leghorns has a tendency to alter the general outline of a bird. One possessing a "squirrel" tail usually carries its body more erect than one with the tail at an angle of 45 degrees to the back. These high-tailed, upright carriage birds always appear to be short backed, and always have an erect or semi-erect comb and rather long shanks. During the six months' duration of the present competition the weather has been most variable, and at times only birds possessing stamina could show a satisfactory advance in their totals. Owing to the judgment for trueness to type having been postponed till half the contest was finished, we are placed in a favourable position to observe the doings of the pens during trying weather conditions. There are, in our opinion, certain pens which their owners have had difficulties in rearing, and others that show every evidence of having been troubled with roup, catarrh, and other sickness in their early life. It is very often the case that a breeder has trouble with his young chickens, and at times has to treat them for various ailments; but as soon as these same birds redden up for laying and have that beautiful appearance that a pullet has when about to lay, in a large number of cases the owner forgets the bird's past life, thinks only of how she appears at the time for sending for competition work, and the way she was bred. These birds which have had early set-backs are soon picked out when the genuine hard work comes or the weather is trying. Some continue to lay moderately, but their drawn-in faces, anaemic combs, shrunken legs, overloaded tail appearance, poor appetites, and forlorn look give them away when the subject of stamina comes in. Stamina has had a great deal to do with the manner in which the birds are graded, for without it they cannot stand a year's heavy laying, and then be expected to produce birds even better than themselves. Competitors who think they have been hardly dealt with in the classification can rest assured that one of the reasons for their being graded lower than their expectations is that the birds owned by them are showing the strain in too marked a degree. Owing to the scarcity of green feed, closely bred birds feel its absence and show it in their returns. The

very hot weather, together with the absence of greenstuff, picks out and hastens the death of a number of birds possessing hereditary weaknesses and disease. It would be far better for a breeder to sacrifice a dozen or two eggs than to put up with the trouble and disappointment of rearing the present day usual run of weak constitutioned specimens. The heavy mortality in rearing is often the cause of the disheartening of a beginner.

Heavy Breeds.—We have gone to the expense of leniency in classifying the heavy breeds, which for the most part consist of Black Orpingtons. Not only have breeders to make a big improvement in type, but the size of the eggs and tendency to broodiness have to be amended. There is a very great variety of type amongst the Orpingtons. There are birds with short backs, roach backs, finny backs, and those with cushions resembling those of a present-day Cochin. These backs finish off with an assorted variety of tails. There are true Orpington tails, long tails, and spread tails. Breeders of exhibition Orpingtons know too well the difficulty of producing blacks with that much desired green sheen, so too strict attention has not been given to this feature when passing verdict in this section. The required points of an Orpington are much harder to obtain than those of a Leghorn; hence, as previously remarked, more leniency has been shown in classifying in this breed. Side spikes on single combs are in evidence in too many cases for one's liking: it is a defect which is transmitted. Birds having this fault will be placed in the 4th class in future competitions, and the same may be said of birds having feathers on their shanks in the clean-legged breeds. The combs on some of the Black Orpingtons are too large and hang to one side, so that if they possessed white lobes they would easily pass for a light breed. The build of some, with their long backs, tails, and legs, together with their fineness of bone, more resembles a light breed than a heavy one. The sooner the better it will be for all utility poultrymen when a thorough understanding is arrived at as to what constitutes the type, and the number of points to be allotted for each feature in all breeds for utility purposes, instead of one common standard as issued by the Utility Poultry Club. The severe task of classifying 400 birds, the majority of which possess any number from three to a dozen failings on comparing them with the original standard, is a task not to be envied. Often the remark is heard—"That's So-and-so's type of birds." It may mean that So-and-so's stock compare with the standard so favourably that they stand out from all others; or, on the other hand, that he has been adopting close breeding and has stamped a number of failings into his flock which are easily detected. Shape is half the breed, and features the other half. The writer of these notes once showed a Jubilee Orpington, rather long in back, as a Speckled Sussex in one of the leading young stock shows of England, and won first prize. The same bird won first and cup at the Crystal Palace in the Jubilee Orpington class, thus showing that too much was allowed for colour and not sufficient for shape. The evolution of the Orpington has been remarkable. The late Wm. Cook originated the breed, for one reason, for lovers of the Cochin who objected to the feathering on the legs; but it must be borne in mind that the Cochin of that date was not the mass of balls of fluff it is at the present day. The first Black Orpington that was shown was very clean in face, possessed good eyes, but was not the full-fronted bird of the present day. It possessed width, fair length of back, a moderate tail, and showed more daylight underneath than the show bird of to-day, which has the appearance of being related to the old Scotch Dumpie. In fact, the old time B.O. had the appearance of a robust, rather close feathered, better class utility Black of the present time.

The classification of the competing pens is as follows:—

Class I.—Have passed, having answered all requirements in trueness to type.

Class II.—Have passed, but have faults which need rectifying in future breeding. These faults will be found in the full detailed report given below.

Class III.—Possess faults which will pass them out in the next competition (1919-20), and the breeders must take drastic measures to improve same, otherwise they will not be accepted for future competition. This current competition will admit this class.

Class IV.—Altogether failing to comply with our requirements and consequently passed out.

Detailed Comments on Light Section.

G. W. Hindes (Class I.).—Nearest our ideal in the competition.

O.K.P. Farm (Class IV.).—B, D, and E too small. F side spikes.

Range P. Farm (Class II.).—Strong constitutions, variation in tail carriage.

L. G. Innes (Class II.).—Devoid of Leghorn headpieces, only just managed to get into this class.

Geo. Prince (Class III.).—B inclined to be wry-tailed.

C. Knoblauch (Class III.).—Lacking in stamina.

Oakland P. Farm (Class III.).—Tail carriage variable, assorted sizes and headpieces.

E. A. Smith (Class II.).—Lack uniformity, strong constitutions.

Geo. Howard (Class I.).—F a trifle small, good constitutions, D one of the most typical in competition.

T. Fanning (Class I.).—Robust, good doers, possessing size, and Leghorn characteristics, F a really fine specimen.

W. Lyell (Class II.).—An even, business-like pen, but could do with more size.

Dr. E. C. Jennings (Class IV.).—D and F very small, spoiling pen altogether, too high tail carriage and tails too erect, A, B, and C good bodies.

R. Holmes (Class II.).—Rather narrow, could do with more room behind in some cases, splendid open faces and fine textured combs.

T. B. Hawkins (Class II.).—C bird appears on the weak side.

G. H. Turner (Class III.).—C and E too small, E white in face, pen lacks uniformity.

Mrs. L. Henderson (Class I.).—Good bodies and tail carriage, neat heads.

Homalayan P. Farm (Class II.).—Very variable, B inclined to be weak, F bird an ideal specimen.

C. Porter (Class III.).—Splendid bodies, but all white in face.

C. P. Buchanan (Class II.).—Rather on fine side, but strong, good doers.

J. W. Newton (Class II.).—Largest in competition, too coarse in cases; headpieces away from requirements, being too large in some and rough textured in others.

Dixie Egg Plant (Class II.).—Not of the largest, D and E possess neat heads, the others having very small combs, rather fine in type, faults largely counteracted by stamina.

J. Zahl (Class IV.).—Lacking in stamina.

Mrs. R. Hunter (Class II.).—Heads trifle coarse; good size, shape, and bone; A and E have side spikes on comb.

W. Becker (Class III.).—Squirrel-tailed, C wry-tailed, combs too erect, only just managed this class.

E. Chester (Class III.).—Side spikes in evidence, lack size and substance, splendid constitutions.

Quinn's Post P. Farm (Class II.).—B bird too fine in bone, good bodies; F erect comb.

Mrs. A. T. Coomber (Class II.).—Size varies, C spoils pen, F very typical.

Thos. Taylor (Class II.).—B bird too fine, otherwise first-class pen.

J. M. Manson (Class II.).—Could be more uniform.

H. F. Britten (Class I.).—A very nice light-feathered pen, showing no weediness whatever.

G. Williams (Class II.).—On the narrow side and not too uniform.

A. W. Walker (Class I.).—A pen we like very much, being very typical and good doers, evidently were used to intensive housing before arrival at competition.

H. Fraser (Class III.).—Very mixed.

W. A. Wilson (Class II.).—One small bird spoils pen.

S. Wilkinson (Class IV.).—Too small and type very variable.

Mrs. L. F. Anderson (Class II.).—Lack uniformity.

B. Chester (Class II.).—Spoilt by variation in size.

Geo. Trapp (Class I.).—Splendid bodies and carriage.

R. T. G. Carey (Class IV.).—Type and size very uneven.

O. W. J. Whitman (Class III.).—Lacking in stamina.

B. Caswell (Class I.).—Very even and good stamina, want just a little more size.

P. Oldham (Class I.).—Nice headpieces, slight variation in size, good bodies.

J. J. Davies (Class I.).—Good doers, a pleasing pen all through.

Shaw and Stevenson (Class I.).—A first-class pen for type, size, and colour. Constitutions good.

Mrs. A. G. Kurth (Class II.).—Rather coarse in heads, good bodies and stamina.

Progressive P. Pens (Class I.).—A front rank pen for size and shape. Another pen that has evidently been used to intensive work before entering competition.

Heavy Breeds.

J. W. Macrae (Class II.).—Good size, plenty of room, too much tail.

W. Smith (Class I.).—Nice and blocky, type of the best if compared with average utility Blacks of the present day.

F. A. Claussen (Class I.).—Good size and shape, colour passable on arrival in April, 1918.

D. Fulton (Class II.).—Type not consistent throughout, splendid eyes.

Nobby P. Farm (Class II.).—Very strong constitutions, roach backs and too tall on legs.

R. Burns (Class III.).—A big variation throughout in type and size.

E. Morris (Class III.).—Type not regular enough, those possessing shape are too small.

A. E. Walters (Class I.).—A very nice pen, taken all round, not so tall as the majority, headpieces very neat.

Mars P. Farm (Class II.).—Very neat heads, inclined to too much tail.

E. F. Dennis (Class IV.).—Type very variable, poor colour.

W. H. Reilly (Class II.).—Type and size not consistent, type of D bird approaching that of a modern Langshan.

E. M. Larsen (Class II.).—Good constitutions, and not so tall as a good many; could be more uniform.

J. Fitzpatrick (Class I.).—Good size and stamina, not the best of colour.

T. Hindley (Class II.).—First-class headpieces, too much tail, colour in some cases dull and devoid of sheen.

H. Puff (Class I.).—The pick of the R. I. Red pens; two birds in this pen are fit for show bench.

W. J. Mee (Class IV.).—Too small, and altogether away from standard.

A. Shanks (Class I.).—One of the best pens in the heavy section for colour and Orpington characteristics.

T. W. Lutze (Class II.).—Strong big-framed birds on the big side.

CUTHBERT POTTS, Principal.

The Orchard.

A FEW NOTES ON CITRUS CULTURE.

Read at the Fruit Growers' Conference held at Palmwoods, 2nd November, 1918.

By ALBERT H. BENSON, Director of Fruit Culture.

At your last conference, which was held in October, 1917, a long, interesting, and instructive paper on Citrus Culture was read by the late Mr. S. C. Voller, and was evidently much appreciated, as your secretary has asked me to prepare a paper on the same subject for submission to you to-day.

As I have already dealt very fully with this matter in my writings, I do not consider it necessary to go into details now, but will confine my remarks to those points that are of especial interest to growers at the present time. Should any grower require fuller information than that contained in these notes, I would refer him to the last edition of my work on Citrus Culture, issued in 1916, and which can be obtained on application from the Department of Agriculture and Stock.

There are, however, certain well-established facts connected with the industry on which the success or failure of the orchard is very largely dependent, and although these facts are well known to the majority of growers, they will bear repeating as they are of the greatest importance to beginners.

In the first place, the selection of suitable soil and a suitable situation for the citrus orchard is imperative, as without these essential factors the commercial success of the undertaking is very doubtful under existing conditions. Intending growers cannot afford to make any mistakes at the start, but must be certain that the land they select is suitable in every way, which means that, not only must it possess perfect natural drainage, but it must be capable of being worked economically.

This narrows the choice of sites, as the only soils that will fulfil these conditions are deep, free loams or sandy loams that will not retain stagnant water even during periods of heavy and prolonged rainfall, and the choice of such soils is further limited when the cost of working is taken into consideration.

Level or nearly level land is much cheaper to work than hillside land, as practically the whole of the cultivation that is so necessary to keep down weed growth, and to conserve water in the soil during a dry time, can be carried out by horse labour and the use of up-to-date implements of cultivation.

Level land possessing a suitable soil does not wash during periods of heavy rainfall, and thus there is no danger in keeping it in a state of perfect tilth; further, the cost of spraying or cyaniding and the gathering and handling of the fruit is materially reduced, and manures are not washed out.

Other conditions being favourable, it will thus be seen that the more level the land the better, as the cost of producing and handling the fruit is considerably reduced.

Having selected suitable land, the next step is its preparation. This should always be thorough, as once the trees are planted you never get as good a chance again, and, though the initial expense is greater, it always pays in the long run. The same remark applies to the selection of the trees and planting. Only well-grown, perfectly healthy trees should be planted, and they should be planted properly. This necessitates, first, a careful examination of the roots and cutting away all badly-bruised or broken roots, and secondly, the planting of the tree at the right depth and placing the roots so that they will have a downward and not an upward tendency.

To do this, the digging of large or deep holes is not necessary, as, if the land has been properly prepared, all that is required is to make the hole large enough to take the spread of the roots, and for the tree, when planted, to stand in the soil at the same depth it stood when growing in the nursery. The centre of the

hole should be a little higher than the sides, so as to give the roots a downward trend.

If dry at the time of planting, place a little fine top soil round the roots when they are placed in position, and then give the tree a good watering and fill in the hole with soil. This will give the tree a start, as the water will not dry out quickly on account of the soil mulch above the wet ground, whereas, if a surface watering is given, the effect is soon lost.

We now come to one of the most important parts, and that is the pruning of the young tree as soon as it is planted. In removing the young tree from the nursery, it has been deprived of most of its root system, especially the fine, feeding roots, so that it is necessary to reduce the top in order to give the root system a chance to recuperate, and it is also necessary to cut back so as to provide a strong framework for the future tree. This means that only a limited number of branches are left, not less than three nor more than five, as these first branches eventually become the main limbs of the tree. Many growers make the mistake of leaving far too many branches, with the result that the branches are too crowded and very weak, so that when they are laden with fruit they are unable to bear the weight and frequently break down. This is often seen in the case of mandarins, and particularly with the Beauty of Glen Retreat, which requires very careful attention when young, as it is apt to produce a dense growth of weak wood unless its main limbs are properly established and all subsequent growths are kept severely thinned. If the tree is not pruned out properly it will overbear, the result being a great crop of undersized fruit one year, that is hard to dispose of, and a sickly looking tree and very little fruit the next.

No citrus tree should be allowed to grow into a dense bush, as it is impossible to spray such properly, and consequently they become a breeding ground for all kinds of pests. A typical citrus tree should have one main trunk from 18 inches to 2 feet high, with not more than three to five main branches, and these main branches should only be allowed to carry sufficient subsidiary branches to form the framework of the tree. All others are unnecessary and should be removed.

The inside of the tree should never be crowded, the limbs should be properly spaced, and the outer branches on which the fruit is produced should not only shade the inside of the tree, but the ground under the tree, so that as long as the lower branches are clear of the ground, when in fruit, they can be left on.

High heading is not, in my opinion, desirable in this climate, as the ground requires shading from the summer heat, and, further, the more of the crop that can be gathered from the ground the better.

The great fault of beginners is that they are afraid to prune hard enough, and there is frequently much more harm done to the trees by under-pruning than by over-pruning.

Properly pruned trees produce regular crops, as they make a good growth annually, but under-pruned trees are very apt to over-bear one year and consequently to make little new growth, so that the following year they have a small crop and have to make wood for the next season's crop.

The pruning of the lemon is quite different from that of the orange or mandarin, once the tree is given its permanent shape, as, unless the long straggling growths it is prone to throw out are kept well shortened back, so as to encourage the production of fruit-producing laterals, you get a very untidy tree that bears the majority of its fruit at the ends of long branches that sway about in the wind and rub or bruise much of the fruit. In pruning the lemon the main object is to encourage lateral growths on which to grow the fruit, and to discourage the production of long straggling branches. A well-pruned lemon-tree in full bearing should not be more than ten feet high, and should have its laterals so spaced that there is no overcrowding. Such a tree will bear even crops of well-grown fruit, whereas a tree allowed to run wild will produce a lot of coarse fruit which is hard to dispose of.

So far I have only dealt with the pruning of young trees and healthy trees, but it frequently happens in old or neglected orchards that quite another class of pruning is necessary—namely, pruning for renovation. This is a very important matter, as, if it is carried out in time, many an apparently worthless tree can be brought round and made to produce profitable crops. The bearing wood of many old trees frequently becomes useless as the result of drought, neglect, starvation, want of pruning, insect or fungus pests, &c. The wood is hidebound and there is no free flow of sap. Such trees frequently show signs of gum on the main branches and they throw out many water sprouts. Trees showing these symptoms should have

their roots carefully examined, and if the roots are found to be healthy, they can be brought round by giving them proper treatment. This consists of removing the top of the trees, cutting back all limbs till sound, healthy bark and wood are met with, and removing all dead or superfluous main branches. The tree is then painted or sprayed with a strong solution of lime-sulphur, not less than one part of the standard solution of 32 deg. Beaumé in 10 of the mixture when used as a spray, or even much stronger when used as a paint. The ground round the tree should then be worked up well and a good dressing of a complete fertiliser given. This work should be done when the tree is more or less dormant, and as soon as rain comes young shoots will make their appearance all over the tree, and these should be carefully thinned out, only leaving enough to form the new top of the tree. If these young shoots make a strong growth they should be checked, so as to encourage lateral growth, and this in turn must be thinned out. If this work is carefully carried out a tree that was practically useless on account of its worn-out top will have a new head of vigorous growing wood which will produce good fruit. If the tree is then properly looked after—that is to say, kept pruned, manured, sprayed, and cultivated—it will continue to yield a profitable return for many years.

The next point to be considered is how to keep the orchard clean—that is to say, free from insect and fungus pests. The first consideration is to keep the trees in a healthy and vigorous condition by proper pruning combined with thorough cultivation and systematic manuring, as healthy vigorous trees are able to throw off many pests that a weakly, neglected tree would succumb to. The second consideration is to systematically inspect the whole of the trees in the orchard at regular intervals, so that the presence of any disease can be detected before it has become firmly established, as it can then be stamped out before it has had time to do serious damage.

The trouble is that many orchardists fail to recognise the importance of taking steps to fight diseases as soon as they make their appearance, and frequently allow their trees to become so badly infested that their vitality is seriously injured; the crop suffers in consequence, and the cost of cleansing the orchard and bringing the trees back into a healthy condition is a heavy tax on the grower. Diseases such as borers of all kinds, gumming, both of the branches and around the collar of the tree, bark-destroying fungi of several kinds, and red scale, require attention as soon as ever they make their appearance, and if they are taken in hand promptly they cause little damage, but if they are neglected the tree soon shows signs of distress.

In fighting fruit pests the old saw “A stitch in time saves nine” is very sound advice and should be kept in mind by all growers, as by acting up to it they will be saved a lot of trouble and expense.

I will not go into further details to-day, as I have just revised an edition of my pamphlet on Fruit Pests, which I have tried to bring up to date, and which is now in the hands of the Government Printer, so that, when issued, I trust it will be found useful to growers.

I will now conclude my remarks with a little general advice on marketing the fruit, as no matter how well you keep your orchards, and no matter how good fruit you grow, you will not get the best returns unless it is properly marketed.

Now, what I mean by being properly marketed is, that the fruit must be placed on the market in the best possible condition, so that when opened up for sale it will show off to the best possible advantage.

To do this the grower must spare no trouble—he must gather the fruit carefully so as to prevent bruising, he must grade it, both for size, quality, and colour, and he must only pack one grade of even size, quality, and colour in a case, so that when the case is opened up for sale the fruit will not only show to the best advantage, but the shown surface will indicate the quality of the whole of the contents, and buyers will know exactly what they are purchasing.

Fruit will have to be packed in this manner in order to comply with the Victorian regulations, and, therefore, it is advisable to pack all fruit properly, so that there will be no difficulty in their being admitted into any State.

In the case of our local Queensland markets, our regulations demand honest packing and the correct marking of the case, and growers who fail to comply with the law are being proceeded against.

The honest packer has nothing to fear, and it is only fair that he should be protected from the man who tops his fruit or puts it on the market under another man's brand.

Horticulture.

THE ROSE GARDEN.

Roses Pegged Down.—The object of bending over the long growths of roses is to induce the eyes all along the shoot to start into new growth and to produce blooms. If the long growths are not so bent, the sap flows to the extreme ends, and only those buds at the ends will move. If you observe a wild rose in the hedge-rows you will usually find some long growths have arched over naturally and they are studded with shoots and blooms. It is not at all necessary to peg the ends into the soil. The best plan is to drive a few stout pegs into the ground, then attach tarred twine to them by making a notch so that the string cannot come off. The end of the growth is then secured to the string and bent at any angle preferred. The ends may touch the ground or be a foot or so away; it is immaterial. We like to peg one or two growths and allow the others to grow naturally on such plants as are suitable to treat in this way. If such as W. A. Richardson are pegged, all the growths may be bent, and towards autumn a number of new shoots will spring up from the base, and after attaining a height of about 3 feet will flower at their extreme ends, and most lovely sprays they will produce. Any rose at all shy in blooming should have its growths trained horizontally or arched over. This will induce it to bloom quicker than anything, only the growths must be hard and well ripened. We cannot expect much bloom from pithy wood. We have seen standards of such shy bloomers as Reve d'Or with their growths tied out horizontally to a framework of bamboo, and in a year or two they bloomed marvellously. Some of the old growths are removed after flowering, and new growths take their place another year.—“The Garden.”

GARDEN WORK AND HEALTH.

No one who pays the least attention to the ebb and flow of public taste can fail to note the ever-rising tide of the gardening instinct. In striking contrast to many other pursuits the interest in matters horticultural flows on and on, but never does it ebb. There are few outdoor amusements of which the same remark can be made. The last thirty years have seen the wax and wane of many open-air games and occupations. Tennis and croquet, so absorbing in their day, have had their ups and downs. Cycling—useful as it is—does not hold the position in public favour which it did a few years ago. Motoring, though just now in the ascending scale, may have given place in another decade—who knows?—to airships. The young and the strong may indulge in these and many more pastimes while health and strength last; then the wear and tear of the nervous system begins to tell upon them, and they drop behind in the race for distinction, while the weakly are left out of the running altogether. Doubtless all these in moderation tend to healthfulness; when all of them fail in their turn then gardening comes in and fills the gap, and happy is he or she who has a good foundation of experience to begin upon.

The reason why gardening will always hold its own is not far to seek. Nature—the mother of gardens—holds in her beautiful hands the inexhaustible gift of life, and horticulture is one of her chosen handmaidens to distribute the blessings which she is able and willing to bestow upon all who will work for them.

In many branches of natural history destruction is bound to precede exact knowledge. The entomologist pins his beetles to the board. The ornithologist shoots his bird to make sure of its species. The gardener, on the contrary, cherishes the germ; his aim is not destruction, but growth and progress in the pursuit of practical knowledge, and the result of his work is living beauty. And while he toils to wrest her secrets from nature, she rewards him, all unwitting, with the health of mind and body which comes of congenial occupation in the open air. It is true, in a measure, that the gardener must be born, not made, and that, just as we have met with isolated cases in which the song of birds gives pain rather than pleasure, so here and there we find those so closely wedded to the life of towns that a garden to them would be as a waste howling wilderness. But even such as these depend upon the products of the soil so long as they come to them without pains or trouble. The health and enjoyment, however, that follow on genuine work in a garden never come to such as these.

We may be sure that no pursuit will give quicker or better returns in health and wellbeing for thought and work and money expended than horticulture in any of its varied aspects. For in a well-ordered garden work goes hand in hand with good play, and many another bright and pleasant thing, and we feel that there is no exaggeration in calling it, after John Parkinson's old-world phrase, “In very deed an earthly paradise.”

Botany.

TWO NATIVE LEGUMINOUS FODDER PLANTS.

By C. T. WHITE, Government Botanist.

PSORALEA CINEREA.

Mr. A. J. Cotton, in a letter from Brunette Downs, Northern Territory, some little time back wrote: "I am forwarding a sample of herb which grows most plentifully here on our lake country, and on which the cattle do remarkably well, it being the only fodder they get to eat on that part of the country, which will always produce fat cattle when the herd on the rest of the country are half poor. It seems to have some wonderful fattening properties. It is not known in the other parts of the territory (by other parts, I mean the country that is not flooded). Looking at it as it grows in the wild state, it has the appearance of lucerne, and is called hereabouts "urvine" or "herb-vine."

Psoralea cinerea is a very common plant in some parts of Western Queensland and is also found in north-western New South Wales.

The genus *Psoralea* is a large one, comprising about 100 species found in different parts of the world; sixteen species occur in Australia, and of these eleven are found in Queensland.

They are strong growing lucerne-like plants in appearance and hence are often known as "wild lucerne," a sobriquet applied, however, to a great number of wild leguminous plants. The older stems are very tough and fibrous, and two species are recorded as having been used for fibre-making by the aborigines.

Psoralea tenax is a very common species in Southern Queensland and is looked upon as a useful fodder herb. Of species found outside of Australia, J. G. Smith, in Bulletin No. 2 of the Division of Agrostology, United States Department of Agriculture, records the genus as containing several excellent fodder plants. According to Ewart and Davies, in the "Flora of the Northern Territory," some species outside of Australia are considered poisonous to stock, and it may here be recorded that specimens of the species under notice have been received from the Flinders River country, where it is very common, as suspected of poisoning cattle. It is not likely, however, that any of the Australian species are poisonous to stock.

ALYSICARPUS RUGOSUS.

In forwarding specimens of this plant for identification from Corfield, Mr. F. M. Boyd writes: "The plant sent is new to this part of the country, stock devour it in preference to any other kind of grasses or herbage, and it is very abundant this year (March, 1918); horses that get plenty of it are like cornfed animals."

Alysicarpus is a small genus of plants scattered over the world. Two species—*Alysicarpus vaginalis* and *Alysicarpus rugosus*—occur in Queensland, both are found beyond Australia; the former is mostly a coastal plant and the other a more inland one.

The accompanying plate should aid people interested in recognising the two plants referred to in this article, should they come across them at any time, or should they have them growing on their properties, and the interest being taken in native fodder plants warrants the publication of the foregoing notes.



PLATE 31.—*PSORALEA CINEREA*. WILD LUCERNE, HERB-VINE OR URVINE.
(shoot natural size.)

A—Seed pod enclosed in the calyx, natural size and enlarged.
B—Portion of leaf surface, enlarged to show scattered hairs and black glands.



PLATE 32.—ALYSICARPUS RUGOSUS.

A—Pod with four articles; each, except the lowest one, contains one seed, and are easily broken off one from another. B—Seeds (all natural size).

HOW TO ESTIMATE THE YIELD OF COTTON LINT PER ACRE.

The yield of lint is estimated from the number of bolls on the plant thus:—Count the bolls on a number of plants of moderate size, and take the average number per plant. For every 15 bolls where the plants are in rows 5 feet apart, and 20 inches apart in the rows, the yield is usually about 100 lb. of lint (ginned cotton) per acre. Of course, this will vary slightly with the variety of cotton, and with the yield of lint per 100 lb. of seed cotton. On the average, 300 lb. of lint are obtained from 1,100 lb. of seed cotton. Sometimes, however, where the variety has large seeds, or where the seed cotton has been kept for an unusually long time, as much as 1,500 lb. is required to yield 300 lb. of lint. This refers to Sea Island cotton. In several cases in Queensland where Uplands cotton has been planted at distances of 4 feet by 18 inches (7,260 plants per acre), the average number of bolls per plant has been 300. By the above rule these plants should yield 300 lb. of clean cotton per acre. A crop of 1,000 lb. of seed cotton will yield about 300 to 400 lb. of lint, the balance being seed. An average crop of 1,000 lb. of seed cotton per acre, at 3d. per lb., would amount in value to £12 10s. per acre. On suitable land, crops of 1,500 to 2,000 lb. of seed cotton in Southern Queensland, which, at 4d. per lb., is equal to a return of from £25 to over £33 per acre.

THE PROFITABLE PEANUT.

Not long ago the “monkey” or peanut was considered a trifle for schoolboys. Many people still so regard it. It is one of the most nourishing foods on earth. It is estimated that the American crops are worth over £15,000,000 per annum. Farmers there are now putting thousands of acres into peanut cultivation. One man who could only clear a profit of £3 12s. per acre out of cotton, clears £13 5s. out of peanuts. Every part of the peanut is utilised according to Mr. Judson D. Stuart, who has just visited the peanut belt.

In the old days growers dug up the peanuts, picked them off the shoots—peanuts do not grow on the roots but on shoots which bloom and then dive into the ground to bear peanuts—put them in bags and sold them, and that was all.

To-day they use the tops for hay. Peanut hay is nourishing. It is easily cured, cattle like it, and thrive on it, and there is about £5 worth of peanut hay to the acre, sometimes more.

The peanut is of the same family as peas, beans, and other leguminous plants. It gathers nitrogen from the air, and deposits it on the roots in nodules. Whenever it is possible to plough the roots back into the ground they supply sufficient fertiliser. Some cut the hay and then plough the peanuts out, have them hand picked, and then plough the roots back into the ground, but this is not the quickest or most economical way. The customary method is to pull the entire plants, stack them on poles to dry the peanuts, then have the peanuts picked and the tops made into hay.

The peanut itself is full of money. The shells are not used for certain kinds of flaky breakfast foods, as has been said. They are ground into fine, velvety-white powder and sold to tin plate makers. There are but two things that will polish tin plate without scratching, middlings and peanut-shell powder, and middlings are now too expensive. Peanut oil is the most nourishing oil in existence, far better than cotton seed oil. It is used largely in place of olive oil.

The peanuts to be sold in the shell are put in drums, sometimes with a little marble dust, but not always, and whirled until the shells are smooth and white. Other peanuts are shelled and put into bags. These are for salted peanuts and also for peanut butter.

The cakes left after the oil is extracted make the highest-grade fodder for cattle. The United States Government is just now experimenting with peanut bread. The peanut butter is more nutritious than dairy butter, and excellent butter is made of peanut oil, a form of butter that no one can object to, as it contains no animal fat.

Even the boys are making gold out of peanuts. The U.S.A. Government has sent agents and instructors among them and organised clubs. These peanut clubs are teaching the boys how to beat their fathers at peanut growing, and it is not at all uncommon for twelve-year-old boys to rent an acre from their fathers, plant it with peanuts, and make a profit of £20.—“Popular Science Siftings.”

Apiculture.

THE AMERICAN BEE JOURNAL.

PRACTICAL QUEEN REARING.

The history of bee-keeping in Queensland dates back as far as 1860 and probably earlier, as bees were first introduced into New South Wales in 1822 by Captain Wallis, of the ship "Isabella." How they found their way to Queensland is not clear, but the writer's own experience is that in 1862 most of the pioneer farmers of Queensland kept bees—kept them in empty gin cases, candle boxes, and in other primitive contrivances. Bees, in those days, were found in hundreds of trees in forest and scrub. There were no scientific appliances for extracting the honey. Much was obtained by allowing the comb to drip, and the balance was saved by squeezing the comb in mosquito net. But, as happens in all new industries, improvements soon began. The gin case gave place to the Langstroth hive, uncapping devices, foundation comb, honey extractors, &c. About the year 1880 the Italian bees were introduced by Mr. Charles Fullwood, the race of black bees having been almost exterminated in Queensland by the bee-moth. From that time the industry took a new lease of life. There are few places on this earth more favourable for beekeeping than Australia, and Queensland in particular, and this, in itself, constitutes one of the difficulties of the beekeeper. In most parts of the State there is an abundance and a variety of honey-yielding flowers, chiefly on scrub and forest trees, and the climate could hardly anywhere be more suitable to the life and well-being of the honey bee.

Not only are the bees here able to gather honey and pollen during the whole year, but, in exceptional seasons, to even store some surplus honey during the winter months. With the introduction of more scientific methods than those of yore, bee-keeping in Queensland made great advances. What, however, is greatly to be desired is some good literature on the various phases of apiculture as adapted to Queensland conditions, such a book, for instance, as one lately issued by Frank C. Pellett, associate editor of the "American Bee Journal," Hamilton, Illinois. This very interesting and valuable publication is entitled "Practical Queen Rearing." Mr. Pellett, former State Apiarist of Iowa, is the author of several books, articles, &c., which, like that under notice, contain a fund of practical information and instruction on the subject of apiculture, of which he must have made a life study. He travelled far and wide in the United States to ascertain all the best methods of practice in use in the various apiaries of the Northern and Southern States, and has embodied in this work an exhaustive history of honey bees, their different races, their life history, their improvement by breeding, the equipment needed for queen-rearing, &c. As he rightly says, he has thought it well to make all his descriptions brief and to the point, eliminating all matter not of practical value. Other works, such as those of Doolittle, Alley, Sladen, and other well-known practical apiarists, have been freely consulted, and the book is profusely illustrated, most of the illustrations having appeared in conjunction with the many articles from the author's able pen which have appeared from time to time in the "American Bee Journal." We think we shall be borne out by our practical bee masters in this State when we express the opinion that such a valuable publication as "Practical Queen Rearing," is one that should find a place on the bookshelves of all apiarists. It may be obtained from the proprietors of the "American Bee Journal," Hamilton, Illinois, U.S.A. The price, inclusive of one year's subscription to that journal, is 1 dollar 75 cents.

Entomology.

REPORT UPON CANE GRUB INVESTIGATIONS AND OTHER PESTS

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report upon cane grub investigations and other pests from the Entomologist, J. F. Illingworth:—

During the month we have done considerable travelling, and by consultation with numerous leaders of the industry, in the various districts visited, we have been able to increase materially our knowledge of the habits of the various pests of sugar-cane.

Incidentally Mr. Girault and I have been devoting considerable time to the introduction of the tachinid parasites of the beetle borer (*Ceromasia sphenophori*) in infested districts. It will be recalled from former reports that these parasites had already been liberated at Moolaba, Babinda, and on the Mulgrave. During the past month we have secured fresh colonies and liberated these on the Johnstone and the Herbert. Those of the first locality were placed on the farm of Mr. R. Davis at Daraji; while on the Herbert they were placed at two points—Mr. Comba's farm, about 25 miles upstream, and in the mill nursery at Macknade.

INVESTIGATIONS AT MOSSMAN.

On all of our previous visits to Mossman, we had secured our supply of the parasites from the mill nursery, hence I was considerably disturbed to learn that this paddock had been burnt and milled, precluding all hope of securing further supplies there. A careful search of the district demonstrated that the beetle borers were scarcely in evidence anywhere; but, wherever found, there were unmistakable signs that the parasites were with them and that they were completely under control. On one farm I found these indications of the flies fully 15 miles from the mill nursery where they were liberated in 1910; and, what was most remarkable, there were several miles of forest country between these two points, with no sugar-cane. Evidently the flies have travelled up the country with the wind.

Upon the advice of Mr. C. J. Crees, the mill manager, we were able to locate a few borers on the farm of the Crees Bros. The pest had evidently come from a pile of discarded cane which had been dumped alongside the field when planting, for only a small semi-circular area in the field, opposite this rubbish, was affected. It was also very noticeable that most of the infested stools were rat-eaten, and the indication was that the rats had been digging out and feeding on the borer-grubs. Fortunately, most of the grubs that we were able to find in this spot were fully parasitised—the best material that I have ever seen. The benefited regions, where we are placing the parasites, certainly owe much to the public spirit of the Mossman Mill management, and to the public spirit of the above gentlemen, for assisting us in cutting up their crop to secure the parasites without recompense.

We sometimes hear criticism of the cultivation at Mossman, and it has been said that of the three kinds—extensive, intensive, and pretensive—theirs consisted largely of the latter. This is hardly just to the district, for the remark would never be made by one familiar with conditions there. Most of the Mossman soils are of a type very difficult to work under the climatic conditions. Consisting largely of clay, as most of them do, it is necessary to work them when the moisture content is just right; and since they are usually either too dry, or too wet, it is a difficult matter to turn them up without lumping. As is well recognised among the most experienced growers of the district, the abundant application of green crops will do much to alleviate this condition and put the soil in better tilth—even without the application of lime, which is now at a prohibitive price.

The rat pest, on some farms, is coming largely under control by clearing out weedy headlands and other areas bordering the cane fields. This is done in some cases by fencing close to the cane along streams and so forth, so that stock can be turned in to assist in keeping the waste places clean. It is an excellent idea, and if carried out generally, would do much to put the rats out of business. It certainly offers every facility for their natural enemies to get at them.

As indicated above, I took advantage of the occasion to try to learn what factors were responsible for the control of white grubs in the district. It will be remembered that this section was once badly affected.

Upon looking up the records at the mill, I found that after they started crushing in 1897, they paid out the following amounts for beetles and grubs collected:—1898, £16; 1899, £16; 1900, £88; 1901, £288; 1902, £656; 1903, £456; 1904, £548; 1905, £1,560 (the last year of the kanakas); 1906, £357.

During 1906 the growers decided to try out the use of carbon bisulphide, which had been recommended by French, the Victorian entomologist, for the control of the grubs, hence they discontinued payments for collecting the pest, and it was never resumed. However, as Mr. Harry B. Staples, who was mill chemist at the time, states in his report dated 16th August, 1910, the carbon bisulphide was not always satisfactory and never came into general use.

I was very much interested to learn, from the many interviews with growers, that the factors which we have been advocating are, evidently, the ones that have gotten the grubs under control at Mossman. These are, late planting and cultivation, resistant varieties, nitrogenous fertilisers, and the application of green manuring or other organic matter.

I learned from Mr. George Muntz, chairman of the board of directors of the mill, and one of the oldest growers of the district, that about the year 1906 there was a general change from early to late planting, and that this latter has been the practice up to the present time. He said that even after the mill ceased collecting grubs and beetles, as indicated above, this pest gradually became less and less in the district. Naturally, he concludes that late planting and cultivation is the explanation.

Mr. E. D. Hunt, an American, though a recent arrival, is making a success on a farm which was, up to the time that he took it, thoroughly infested with grubs. The soil is a sandy loam, lying along the river bank, hence is subject to occasional overflow. Late in 1915, Mr. Hunt planted a few acres of cane and treated it during November-December with about a bag (160 lb.) of sulphate of ammonia to the acre. He grows principally D 1135; and had continued the application of this fertiliser to all of his crop, with the result that he has never suffered from grubs, though feeding trees are abundant along the stream bordering his farm.

The farm of the late J. D. Johnson is another estate that was once badly infested. Mr. Johnson tried every possible remedy and was a great experimenter, but he had little or no success until he changed to D 1135 and late planting. His losses from grubs were immediately greatly reduced. There is little evidence on the place now of the presence of grubs.

Mr. R. A. Donnelly, another director of the mill and a grower of long experience, told me that he had no trouble from grubs for about five years after clearing his land from the scrub; but as the soil became poor the pest became evident and did great damage in places—as many as twenty-six grubs under a single stool of cane. He considers D 1135 very resistant and says that it will ratoon and make a very satisfactory crop after being attacked, while other canes die out so as to be worthless. He also considers late planting and cultivation very important as controlling factors, and called my attention to the success of these on the adjoining estate, which is known as the Syndicate. This place, though badly infested, was cleared of the pest by late planting and thorough cultivation.

Mr. J. M. Pringle, on a rather large estate of clay loam soil, also believes in late planting and the application of green crops to improve the tilth. Grubs have not been bad since D 1135 was planted in 1910. He once tried an experiment of planting B 147 alongside D 1135 and it was all destroyed by the grubs, while they did no noticeable damage to the latter variety. He uses meatworks manure on first ratoons and nitrates on later crops, with good success.

Mr. Pringle also told me that Mr. Low, on the adjoining farm, formerly greatly troubled by grubs, got good results from late planting and thorough cultivation. He said the soil was too wet for early planting (before May)

Mr. W. S. Johnson, who is managing Drumsara for S. Johnson, senr., began farming in the district in 1908. He informed me that late planting was the general practice at that time. D 1135 was beginning to be used. He planted misses in a field of Goru with this variety and all the Goru was eaten out by the grubs, leaving the D 1135 apparently uninjured. Hence, he considers the latter very resistant to grubs.

Evidence dealing more particularly with the value of sulphate of ammonia as a controlling factor was supplied by a number of growers in addition to those already referred to above.

The extensive estate of the late R. O. Jones was subject to serious losses from the grubs during the early years of the mill. He stated before the Royal Commission (6th November, 1911) that he cultivated 450 acres of cane in 1905 and lost 250 acres completely through grubs—fully £5,000 worth. At that time, just before he died, he said: "No human intelligence, so far, can contend with the grubs' depredations, and I do not think anybody has studied the subject more than I have." The estate was broken up into smaller farms and the sons took charge in 1911. They began the general use of sulphate of ammonia in November of that year, and planted part of the land to Mauritius beans. The cane crop was planted early, but in spite of that it did not suffer from grubs, and from that time they have had no further trouble. Mr. W. P. Jones told me that all the surrounding farmers used sulphate of ammonia persistently and that he considers it the active agent in the control of the grubs.

The farm of Crees Bros., a light sandy soil along the river bank, was once badly affected by grubs. The former owner applied large quantities of carbon bisulphide with little apparent result. However, after changing from meatworks manure to sulphate of ammonia, a few years ago, the grubs left and there has been no sign of them since.

Mr. H. H. Smith, who has been growing cane in the district for the past twelve years, told me that his fields were formerly eaten out by grubs but not seriously since he began the use of sulphate of ammonia. He plants early and applies about 3 cwt. of the ammonia to the acre in two dressings, during December and January. On one occasion he left a few rows untreated in a field of Goru, and these suffered badly from grubs. Naturally, he is a firm believer in the application of this manure.

Mr. Donnelly also experimented with sulphate of ammonia, by digging up the stools after it had been applied. He found the grubs limp and inactive, though in no case dead.

As an instance of a farm which has had no sulphate of ammonia, I visited the place of Mr. W. Bunn, at Cassowary. The soil is heavy clay loam and sticks to the plough when wet. Mr. Bunn told me he had no trouble from grubs for several years after clearing the land, but for a number of years now they have been always in evidence. He has used meatworks manure alone; and he told me that he found many large grubs under the stools when they were blown out by the recent cyclone.

I submit this evidence, for it appears to me that it may be far-reaching in controlling the pest in other districts. At any rate, the practice of these better cultural methods has its principal value outside of their relation to grub-control.

HERBERT RIVER DISTRICT.

The principal cane-growing areas lying along the river have ideal soil to work; but I was surprised to find the fields in such a weedy condition. The great drawback, as I learned later, is the labour market during the cutting season, the men

demanding up to 30s. a day for chipping. Meatworks is practically the only manure in general use; though sulphate of ammonia has given excellent results wherever tried. Furthermore, there has been no general practice of green-manuring in recent years; and I was also surprised to learn that the growers do not recognise the value of the mill compost, for hundreds of tons of this valuable manure is piled up in ricks and has been leaching away for years—the present supply is being used for ordinary filling of mud-holes and the ashes for surfacing the roads. If put up in bags this product should command a considerable market value.

As is well known, this district was once subject to serious injury from grubs; and, since the pest has largely disappeared in recent years, I was interested in investigating the matter.

There seems to be a definite relation of grub-infestation on the Herbert to feeding trees, for the areas which were infested in the early days are now free, while the farms that suffer at present are the outlying ones, bordering the scrub and forest—especially in proximity to the hills, which are covered with timber.

The management at Macknade gave me every possible assistance and kindly furnished me itemised figures of the beetles collected in their district during the past twenty years, with the amount of cash expended. These figures show that decidedly the worst infestation was from 1897 to 1901; then, from 1902 to 1915 the numbers were greatly reduced, and after the latter date, which was the year of the drought, the pest practically disappeared, except on the farms most distant from the mills.

It may be interesting to note that during the above period the mill paid out £11,272 17s. 10d. for 334,022 quarts of beetles, without any noticeable decrease in the pest from year to year. The marked reduction after 1915 was evidently due to natural causes, and was probably in no way connected with the hand-picking.

Very little cane in this district is burned before cutting—last season only about 5,000 out of 130,000 tons; but the trash is largely burned afterwards, so that it is not conserved for humus. It appears to be the general custom to take off only one ratoon crop and to plough this out and plant cane again immediately.

The burning of trash has evidently had a deterrent effect upon the beetle borers, for they are by no means a serious pest in the district. Even on the farm of Mr. Comba, near Hawkin's Creek, most of the grubs were right down in the butts, and it was very hard to discover any of the damage without first cutting cane.

Mr. W. Walker, who has been connected with the industry for the past forty years at Macknade, gave me a number of his interesting observations.

In the days of the kanakas, he said, the trash was removed to every third row and he found that grubs were always in these trash rows and the cane of these rows suffered during dry weather. This may evidently be explained in that the grubs, which naturally develop under trash, are forced down into the soil by drought and are then compelled to feed upon the cane roots.

At another time, Mr. Walker observed that the beetles were attracted to the lights of the quarters, and later on, when the grubs began to do damage, it was worst in the cane bordering these buildings—the beetles evidently going back from the light to the cane to lay their eggs. He also noticed that the beetles went with the wind from a fig-tree which stood in the field, and the cane was usually considerably more infested on that side.

Regarding the beetle borer, Mr. Walker informed me that they were first seen nine years ago,, and that they must have come from plants received from New Guinea. The moth borer, however, which is a native insect, he said, was very troublesome as far back as 1889. This insect, which is well controlled by parasites, has done little injury in the district in recent years.

Mr. W. Authur, who is considered one of the best agriculturists of the district, once suffered severely from grubs, but not for the last five or six years. He uses

green-crops which he ploughs in preparatory to early planting. His soil is clay-loam and rather heavy, but he keeps it in good tilth by conserving his trash—none is burned. The single crop of ratoons is volunteered, and the double trash worked into the soil with a green-crop before planting another series of cane. He cultivates the plant-crop well, and applies about 5 cwt. of meatworks to the acre. It is his intention to use sulphate of ammonia on his ratoons during December, if it can be procured. I noticed that his headlands and fence-rows were clean—a factor important in the control of rats and other vermin.

Evidently the immunity from losses by grubs on this farm is due to the cultural methods, for the owner supplies the required humus and ploughs at a season when the beetles are depositing their eggs—December to February.

DESTRUCTION OF TACHINID PARASITES AT THE MULGRAVE.

I regret being compelled to report that our colony of tachinid parasites of the beetle borer was destroyed through the lack of co-operation on the part of the farmer on whose place the breeding-cage was located.

The understanding was that the borer-infested field was not to be cut until the end of the season and the part just around the cage was not to be burned.

I was considerably disturbed to find, on 10th October, when I made a visit to the cage, after my return from the Herbert River, that the whole field had been burned and cut, and the cage had been dumped out and torn up in moving it into the adjoining field of young plant cane.

Mr. Girault and I not only made two trips to Mossman to get this work started, but we have also had to make frequent journeys out to this farm, so that the parasites would have every opportunity to become established.

It is certainly discouraging to find that they now have no chance. The flies that we liberated, having reproduced, are dead, and the offspring are destroyed in the burn and the milling—it is only by a miracle, if any got away.

I have not been able to see the farmer in charge of the place, for he was away from home; but the matter was reported to the management of the Mulgrave Central Mill, since they were so urgent that we co-operate in the matter of establishing these parasites in the district.

THE LANTANA SEED-FLY.

I was interested to note the remarkable distribution of the Lantana Seed-fly. It has apparently spread all up and down the coast, since its liberation in the Cairns district in February, 1917. I found them well established at Mossman and even as far south as the Herbert River—where they were found all over the district. It is certainly remarkable that so small a fly could cross the natural barriers between the above districts, for there must be considerable stretches with no lantana for them to feed upon.

These insects are doing excellent work wherever established. The eggs are laid in the flowers and the infestation is noticeable even on the green fruit, for it becomes discoloured with brown streaks, and usually withers and falls before becoming ripe. In practically every case, the kernel of the seed is destroyed, so that it will not germinate. This in no way affects the parent plants, however, and they will live on for years if not cut out. I would strongly urge that everyone lend a hand in destroying this weed, if it is found on his premises, now that nature is stopping the spread.

Note by General Superintendent.—With reference to the expressed opinion as to the resistant powers of the variety of cane known as D 1135 to the attacks of grubs, it may be pointed out that this cane is not resistant to grubs in Southern Queensland.

MOSQUITO DESTRUCTION.

We are obliged to Mr. W. R. Colledge, Brisbane Associated Friendly Societies' Dispensary, for the following very interesting paper on this subject, which appeared in the "Comptes Rendus," Hebdom. Sc. Acad. Sc. Paris, and translated by Mr. Considine. It refers to a method of mosquito destruction which might be usefully followed by suburban gardeners and small farmers in many parts of Queensland, and we draw attention to it, as mosquitoes are now beginning to be troublesome. The article is entitled: "Parasitology.—A new method of destroying mosquitoes by alternating their breeding places, by MM. Edom et Sergent."

Under Mediterranean climatic conditions, the average length of the life of mosquito larvæ in water till metamorphosed into the perfect winged insect is about three weeks (sixteen to twenty-five days).

We suggest the name "mosquito-breeding places" (gîtes) for the accumulations of water favourable for the reproduction of these insects.

These breeding places are sometimes of considerable size; such as lakes, pools, inaccessible marshes, and large streams. Only the labour of the engineer, that transforms the face of the land, suffices to deal with these large breeding places.

But sometimes breeding places of very limited size cause infestation of a whole region.

In a number of villages the maintenance of malarial mosquito breeding-places is freely kept up by water flowing from small springs, fountains, small reservoirs, washing pools, and irrigation canals. Trickling streamlets grow and widen out to form pools, in which the water is constantly changed without any strong flow, and which form excellent breeding-places for the anophelines.

Since commencing our first anti-malarial campaign in 1902, this type of breeding-place has been dealt with by the recognised anti-larval measures, such as replacement by masonry and concrete, cleansing, maintenance of repairs, mowing of herbage, application of kerosene, filling in of cattle hoof tracks, control of waterways, and efficient drainage.

For the last ten years we have experimented with success with a new and simpler method of procedure, in the Tell region of Algiers.

It frequently happens that the breeding-place is on the course of a single stream. On this we dig two channels, which, each for a week in turn, carry all the water. The water is turned into either channel at will by a simple earth dam or a water gate.

Each channel in turn during its week of use becomes the breeding-place of egg-laying anophelines and hatching larvæ. Then comes a dry week without water, when the channel is dried by the heat of the weather and the larvæ perish.

Each channel is alternately wet and dry for a week at a time, all the labour required being a few strokes of a mattock to break the one dam and rebuild it in the other channel, or double water gates may be used with advantage.

The arrangement may be varied. Instead of digging two channels, the water may be spread to the right or left by a series of secondary dams, in such a way that it may be absorbed by the ground or evaporated off within eight days. The water is not turned onto the same ground for some weeks. In this method little earth dams are used.

The method of drying off the breeding-places gives excellent results with but very little attention, and expense is considerably reduced. At a very moderate estimate, costs are reduced to a tenth of those of the usual anti-larval methods.

Summary.—A mosquito breeding-place of a permanent character is not necessarily dangerous. The remedy lies in substituting two alternating ones for the single permanent one.

In the Mediterranean region, mosquito larvæ require a breeding-place to be permanent for about three weeks. If this period is broken, so that each portion is alternately wet and dry for a week at a time, the larvæ cannot survive.

Science.

Snake-bites and their treatment.

We have received several letters from subscribers and others, asking for the best cure for snake-bite, and as the reptiles are now beginning to be more numerous as the summer weather advances, we republish an article on the subject of snakes and the remedies for their bites which appeared in this Journal in March, 1911. In a most interesting pamphlet on "The Venoms of Australian Snakes" (1906), Dr. F. Tidswell, M.B., shows that in 87 cases of black snake bites, no deaths resulted. The tiger snake was responsible for 15 deaths out of 33 cases; the brown snake, for 15 out of 32; and the death adder for 5 out of 10 cases. Arranged in order of lethality, the death adder appears as the most lethal snake (50 per cent. of deaths); but close to it comes the tiger snake (45.5 per cent. of deaths); next, but far below, comes the brown snake (fatality, 18.7 per cent.); and, lastly, comes the black snake, to which *no fatality is attached*.

A correspondent has written suggesting that, in the interests of miners, some information should be given in the journal concerning snake-bites and the best known methods of treating them. It is an undoubted fact that men engaged in mining and in prospecting run great risk from snakes, both on the surface and in abandoned shafts, which often have to be reopened; and, as such men are generally far removed from medical aid, it is well that they should know the best thing to do when anyone is bitten, and that the means to be adopted should be as clearly and widely made known as possible. Unfortunately, as far as internal remedies are concerned, investigations by competent authorities go to prove, as will be more fully explained later on, that to be armed with a reliable antidote is not nearly such a simple matter as the correspondent mentioned seems to think. He has been informed that the poison of the death adder acts on the nerves, while that of the black, brown, and other venomous snakes acts on the blood; and suggests that the miner be made familiar with a specific for each class of bite of such a nature that he could be provided with it, and ready for any emergency. Dr. A. Muller, however, in his work on "Snake Poison: Its Action and Its Antidote," came to the conclusion, after full investigation and experiment, that all snake venom is a nerve poison; but Professor Martin, who, when in Australia, also made a study of the subject, seems to draw some distinction, inasmuch as he refers to the futility of the generally accepted remedies to prevent the clotting of blood caused by all Australian snake poisons except that of the death adder. Dr. Muller advocated the strychnine cure as a remedy in all cases of snake-bite; but, as he admits that it may be necessary at some stage of the treatment to administer strychnine in doses which, in the absence of the snake poison, would be fatal, it will be seen how dangerous it might be to try such a remedy without professional aid, even if later investigations had not considerably discredited—as indeed they have—this form of remedy. As to having the right antidote available, it is true that anti-venomous serum has been mentioned in this connection, but, as one must apply the right antidote to the right snake, this remedy is hardly practical under ordinary conditions.

HOW TO DISTINGUISH NON-VENOMOUS FROM VENOMOUS SNAKES.

In cases of snake-bite, it is, of course, very important to determine whether the reptile inflicting the injury is venomous or not. Many persons have undergone much pain and often risk from heroic treatment for bites which they have supposed to be those of venomous snakes, but which a knowledge of the external characters of the different species would have shown to have been perfectly harmless. Indeed, it is believed that not a few persons bitten by harmless snakes have been killed either by fright or the treatment to which they have been subjected; while many records of recovery under certain treatment are unreliable on account of the doubt existing as to whether the reptiles inflicting the bites were really venomous. A case occurred in New Guinea (Papua) a few years ago. A member of an exploring party was bitten by what appeared to be a black snake. The man was treated with various remedies, but soon died. The snake was sent to Brisbane and proved to be perfectly harmless. The man simply died of fright or injudicious remedies.

As a matter of fact, far more of the Australian snakes are non-venomous than is generally supposed. The late Dr. Krefft, for many years Curator of the Australian Museum, Sydney, and a recognised authority on Australian snakes, describes twenty-one innocuous and forty-two venomous snakes of this country; but of the latter, he says, not more than five species are dangerous to man or the larger animals,

and these retire underground for nearly five months of the year. The four Queensland snakes which are mostly to be dreaded are the death adder, the black snake, the brown snake, and the tiger snake. To the miner, prospector, and ordinary bushman, many opportunities are afforded of examining dead snakes; and, with a little observation and study, he might soon be able to tell at a glance the poisonous from the harmless species.

In the first place, on opening the mouth of a non-venomous snake, a row of small teeth will be seen along each jaw, and when such a snake bites he leaves two

rows of small punctures, thus— . . . In the venomous snake, these small teeth

are rudimentary, and leave no marks; but towards the outer edge of the upper jaw there are two fangs, and the punctures left by the bite from these are two in number, thus— . . . These fangs, which are the means by which the poison is conveyed from the snake to the person bitten, are not always in a state of projection, and it may be necessary to press the gum down with a stick or penknife before they can be seen; but this should be done with caution, and when it is certain the snake is dead. Sometimes, however, the punctures are not sufficiently distinct for them to be accepted as a reliable guide; but where the snake is seen there are other characteristics which will assist in the identification. According to Dr. Krefft, the gape of the mouth of the non-venomous Australian snake is usually curved upwards;

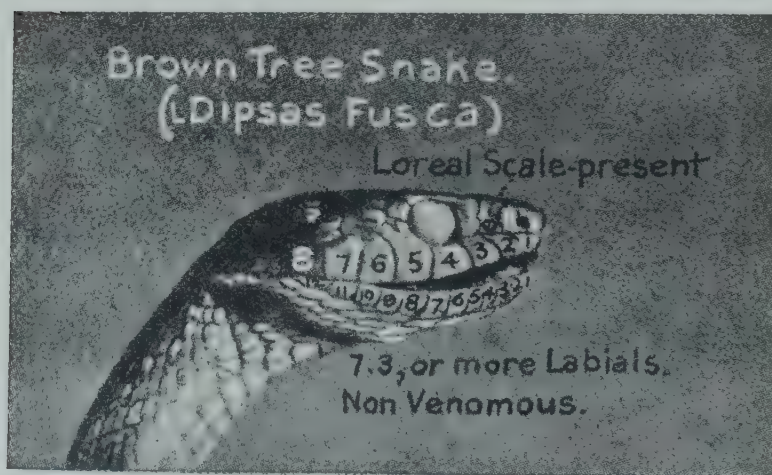
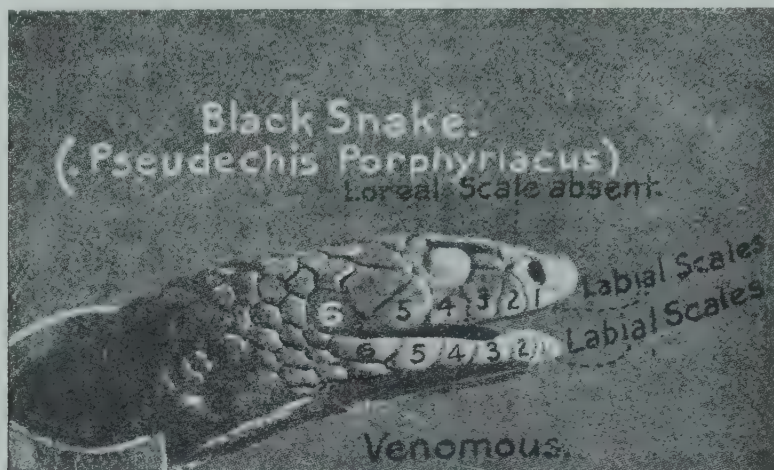


FIG. 1.—HEADS OF VENOMOUS AND NON-VENOMOUS SNAKES.

while in the venomous it forms a straight line. Again, an important distinction is to be found in the labial (lip) scales. Dr. Krefft says that of the labials there are seven or more in non-venomous snakes, while in the venomous "there are generally only six (we may say always six—never more)." He adds that "it may safely be asserted that by these shields alone can the harmless or venomous character of snakes be ascertained. This rule does not apply to sea snakes, nor to blind snakes of the family *Typhlopidae*, but to Australian venomous and innocuous colubrine snakes only." Another distinctive mark is that in the non-venomous snake

there is a loreal scale, which is absent in nearly all Australian snakes. This loreal scale is a supplementary scale which, in the non-venomous snake, is to be found on the cheek between a labial scale below and a frontal scale above, and between the ocular and nasal scales. In the venomous snake these four scales—the labial, frontal, ocular, and nasal—all unite at one point, and are not separated from each other, as in the harmless snake, by the loreal scale.

The head and mouth characteristics which distinguish the two classes of reptiles can be seen at a glance from the accompanying production of excellent photographs (Fig. 1) taken from Nature by the late Dr. John Thomson, of Brisbane, who was a keen student of this subject, and who kindly placed his pictures and other useful information readily at our disposal for the purposes of this article.

Dr. Thomson also had in his possession a diagram (in the shape of Fig. 2) showing, in such a way that "he who runs may read," the chief distinguishing features between the venomous and harmless snake. This diagram, which was originally prepared to illustrate a lecture, should be cut out, and kept by persons in the bush in some place where it may be readily and often seen, so that its points may become impressed on the mind.

TO DISTINGUISH VENOMOUS FROM NON-VENOMOUS SNAKES BY HEAD
CHARACTERISTICS (KREFFT).

<i>Venomous.</i>	<i>Non-venomous.</i>
GAPE OF MOUTH, STRAIGHT	GAPE OF MOUTH, CURVED UPWARDS
LABIAL SCALES, SIX	LABIAL SCALES, SEVEN OR MORE
LOREAL SCALES, ABSENT	LOREAL SCALES, PRESENT
BITE MARKS . . .	BITE MARKS . . .

FIG. 2.

Dr. Krefft states that an Australian snake that is not thicker than a man's little finger, whatever may be its length, cannot by its bite endanger the life of an adult human being. It may be added that the true *freshwater* snake is always harmless, while the saltwater or sea snakes are always poisonous. Few of the tree snakes are venomous; while the carpet snake and the so-called "green snakes" are innocuous. Very often a thick woollen sock or stocking will prevent injury from the bite of a snake, as the fang may not penetrate sufficiently far for the poison which passes down its groove to be injected beneath the skin. There is a very widely accepted belief that the death adder inflicts injury by a *sting* from its tail, but this is not the case.

The general symptoms exhibited by persons bitten by a venomous snake are: Great anxiety, depression and prostration, feeble and intermitting pulse, profuse cold sweats, vomiting, hurried respiration, indistinct speech, dilation of the pupil of the eye, drowsiness, and finally, in fatal cases, unconsciousness and convulsions.

TREATMENT OF SNAKE-BITE.

Professor Martin, late of the Melbourne University, who some time ago was appointed Director of the Lister School of Preventive Medicine in London, before leaving Melbourne, delivered a lecture embodying the results of several years of research into Australian snake poisons. The results of his investigations are somewhat disappointing as far as the generally accepted remedies are concerned. He says that for all snakes except the death adder the only remedy that is of the slightest use is the ligature, applied immediately. He adds—

"If the bite be on the tip of the finger, the ligature may be tied round the base of the finger, if done instantly. If not, we must go higher. It is no use tying anything round the wrist or forearm, nor round the leg below the knee, for in these places the limb consists of two bones, and the circulation cannot be stopped by a band of any sort. We must go above the elbow or above the knee, where there is only a single bone. The ligature must be tied as tight as possible—twisted tight with a stick—for no blood must pass. In half an hour's time the ligature may be removed.

"All the usual remedies, such as ammonia, strychnine, and chloride of lime injections, whiskey, and exercise, are powerless to check the clotting of blood caused by all Australian snake poisons, except that of the death adder. Cutting out the piece and gashing the limb to make it bleed is equally futile. Anti-venomous serum is a remedy, but hardly a practical one, as you must apply the right antidote to the right snake."

Other authorities do not go so far as Professor Martin with regard to scarifying the wound and administering stimulants, and, so far as they are not likely to be injurious, these means will probably continue to be followed as extra precautions. Dr. J. Ashburton Thompson, when Chief Medical Officer of the Government Health Department of New South Wales, issued specific directions for snake-bite treatment. He first advises the use of the ligature, which is to be loosened for five minutes after the first half-hour; then tied and screwed up again. At the end of the second half-hour the ligature may be removed altogether. Dr. Thompson, in continuing his directions, says:—"In places where a ligature cannot be tied, as on the neck or face, pinch up the bitten part between the finger and thumb, and cut it out. In any case, the bitten part should be cut into by numerous little cuts over and around the bite, for about $1\frac{1}{2}$ inches round, and sucked by the mouth freely and perseveringly; and this can be done without danger by any person. Stimulants, such as brandy, whiskey, gin, rum, in small quantities at a time (a few teaspoonfuls), or strong tea or coffee or wine may be given if the patient be faint."

The removal of the ligature as described is a very necessary precaution, for at least one case has occurred in Queensland where, through keeping it on too long, mortification set in, and amputation of the arm had to be resorted to.

Professor Krefft, in his work previously referred to, says:—"The whole treatment resolves itself into this: *Suck the wound, if possible, at once; apply a ligature; lacerate the punctures, and wash the part with water or urine; keep moving, and do not despond.* Half the number of fatal cases have resulted from fear, many persons having died simply because they lost heart, did not attempt to tie a ligature, or were afraid to lacerate the wound and suck it."

A Croydon paper some time ago published particulars of a case in which a cure had been effected by rubbing vinegar into the wound; but in this case the ligature was first applied and the wound scarified. The vinegar was used in consequence of the person treating the patient having seen an extract in the "Queensland Agricultural Journal" from an Indian paper, which described experiments successfully made with it on animals which had been bitten by snakes.

The late Mr. John Wilson, Brisbane, said that in Ceylon he was very successful in saving the lives of coolies who were bitten by cobras or tie-polongas when picking coffee. As soon as a man was bitten, a ligature was put above the wound, then a pin was pushed through the skin, a piece of twine was twisted round the projecting part of the pin and drawn tight. This raised the bitten part, which was cut off with a sharp knife.

The vinegar cure is described in the "Queensland Agricultural Journal" in the issues of January, 1903, January, 1904, and February, 1905. Three authenticated cases of cure of snake-bite by the vinegar treatment have been reported to us since the first article appeared in the Journal.—Ed. "Q.A.J."

ANOTHER ARTICLE ON THE SAME SUBJECT DETAILS AN EASY METHOD OF PREVENTING DEATH FROM SNAKE-BITE.

For the next three or four months snakes of all kinds will be in full vigour and activity, and although deaths from snake-bite are rare in Queensland, still those whose business takes them into the neighbourhood of swamps will run the risk of unwarily treading on a black snake in the same way as the bushman whose work lies on dry ridgy land is liable to make acquaintance with a death adder. Queensland snakes are, as a rule, shy, and nearly always try to escape from man, but when suddenly molested they are apt to show fight, and a deadly stroke of the poison fang may endanger the life of a victim who is far from medical help. We therefore think that a timely publication of a paper under the above heading, by Sir Lauder Brunton, Sir J. Fayrer, and Dr. L. Rogers, which appeared in the Proceedings of the Royal Society (Eng.), Vol. 73, No. 494, p. 323, will be appreciated.

Following is an abstract of the paper:—

The treatment advocated in this paper is the net result of experiments made with the venoms of each main division of snakes, including especially that of the cobra. The Australian black and brown snakes belong to the same family as the Indian cobra, and the venoms of all these snakes, it may be parenthetically remarked, have the effect of clotting the blood of any person or animal bitten. The venom of death adders does not have this effect.

The experiments show that if cobra venom be mixed with a 1 per cent. solution of permanganate of potash the activity of the poison is destroyed and it becomes innocuous. Further, that if a solution of the permanganate be injected into the tissues close to the place where snake venom has been just previously injected, say within from one or two up to five or even ten minutes after the injection of the venom, either no symptoms of snake-poisoning occur or a fatal result is averted, and the poisonous effects are more or less mitigated.

The result varies according as the interval which elapses before the antidote is applied is longer or shorter, and is successful in the same measure as the permanganate is actually able to overtake the venom and mix with it before it has been absorbed by the system. *For whatever part of the venom is brought into actual contact with the permanganate is rendered inert and harmless*, whilst the antidote has no effect whatever on that part which has been actually absorbed into the system. It is therefore of no use taken internally, and of very problematic value if applied to or injected into the snake-bite after any considerable lapse of time, especially if no ligature has previously been applied to stop the circulation in the locality of the bite.

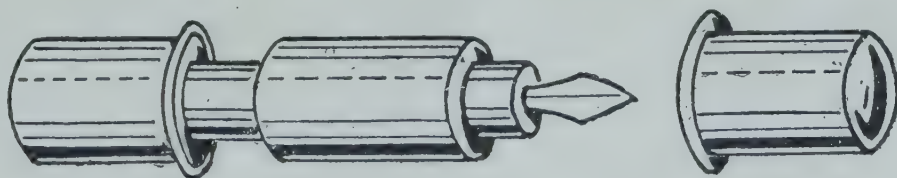
It is estimated that the solid permanganate of potash will neutralise its own weight of venom when directly mixed with it, either solid or in a solution; moreover, it acts on every class of venom, including that of death adders, &c.

Snake venom is cumulative in its action, which means that the ultimate effect is always that of the whole quantity of venom injected into the body and left undestroyed in the wound, and therefore certain to be eventually absorbed by the tissues; for the portion of venom first absorbed does not in any appreciable degree lose its effect as time goes on, nor is it quickly eliminated, but continues its poisonous action upon the system after the remainder of the venom becomes gradually absorbed and actively poisonous, and thus the effect increases or accumulates as the absorption progresses.

It has been estimated that the average amount of venom injected by a full-sized cobra is not more than what would equal 10 lethal doses for a man. Further, in many cases, the full dose will not actually be injected into the human tissues, for various reasons, such as the hindrance afforded by clothing, &c.

The plan now proposed is (after first ligaturing the limb by means of a strip of bandaging or other material tied loosely around it, and then twisted up tightly with a stick) to make a free opening into the site of the bite, deep enough to reach to the lowest point reached by the snake (half an inch should always be sufficient), and to rub in crystals of permanganate of potash. The punctures made by the fangs should be freely cut into, and the permanganate introduced and well rubbed round (being wetted with a few drops of water or even saliva), until the exposed tissues present a uniformly blackened appearance; or alternatively, a solution in water of the permanganate (made, say 1 in 10 in strength) could be used as a hypodermic injection into the punctures.

Sir L. Brunton has designed a suitable instrument for use, which can be carried in the pocket. It consists of a lancet-shaped blade, about half an inch long (long enough, in fact, to reach to the deepest point of a bite by the largest snake). This is set in a wooden handle, about $1\frac{1}{2}$ inches long, which is hollowed out at the other end so as to form a receptacle to hold the permanganate. Two wooden caps are fitted on the ends, one to protect the lancet, and the other to keep in the permanganate.



It is to be noted that this treatment is directed solely against the actual unabsorbed venom in the wound. The subsequent treatment, by strychnine, alcohol, or otherwise, of any symptoms of snake-poisoning which may arise is not interfered with.

N.B.—Never let it be forgotten to loosen the ligature for a few minutes half an hour or so after it has been put on, as otherwise gangrene of the limb may cause its loss, if no worse happens.

General Notes.

LIST OF SOCIETIES.

DALBY.—The Annual Show of the Dalby Pastoral and Agricultural Association will be held on 29th and 30th April, 1919.

The Show dates of the Eastern Downs Horticultural and Agricultural Association, Warwick, have been fixed for 11th to 13th February. The Dalby Pastoral and Agricultural Association will hold its Annual Show on 31st July and 1st August. 5th, 6th, and 7th February have been fixed for the Show of the Stanthorpe Agricultural Society.

A WEED DESTROYER.

Many garden paths, notwithstanding the late dry weather, are covered in parts with grass and weeds; consequently, a considerable amount of hoeing is necessary. These weeds can easily be destroyed by one or two methods. One is to make a strong solution of rock salt, the better if it can be obtained from salted hides. Watering the paths with this will effectually banish weeds. Another remedy is to dissolve 3 lb. of arsenate of soda in 12 gals. of water, and copiously water the paths. Care must be taken not to distribute the solution too near to grass or other edgings of flower beds. If a watering can is used for this purpose, it must be thoroughly cleansed with clean water before being used for watering plants.

AN EXPERIMENT IN VINE TOPPING.

Mr. E. H. Rainford, formerly Instructor in Viticulture to the Department of Agriculture, Queensland, deprecated in his writings on this subject the practice of indiscriminate topping of the vine which many vinegrowers indulge in, maintaining that it is decidedly disadvantageous instead of beneficial, and that it should only be practised when cultural operations render it necessary.

With a view to getting some fact to support the argument, he made an experiment on some vines, with the following result:—

In the middle of three rows of Mataro or Espar vines, at one of the State farms, twenty vines were topped to about 12 inches length above the last bunch of grapes, shortly after the berries had set and were the size of large shot. The topping was renewed twice when the laterals had made sufficient growth to allow it.

Result.—The bunches coloured at least a week later than those on the vines on either side, in some cases ten days later. When the grapes were picked, the grapes of the vines that had not been topped contained 20 per cent. of sugar, while those of the topped vines contained 16.5 per cent. of sugar, and there was decidedly less colouring matter in the skins. Had the grapes of the topped vines been allowed to hang for some time longer, they might have gained a little in sugar, but not much.

Surely this goes some way towards proving that excessive topping is hurtful, and not beneficial; but, as conclusions should never be drawn from a single experiment, other experiments were made with similar results.

This experiment has been well borne out by a previous experiment on Isabella vines. In this case, an amateur gardener pruned off all the tops of his vines, a foot or two above the fruit, of which there was a splendid show on the vines; but the result of topping, so far from benefiting the grapes, proved a positive injury.

In the succeeding season he left the vines severely alone, and, as a consequence, the vines, which in the previous season produced 3 cwt. of grapes irregularly ripened, yielded nearly double the quantity and the grapes ripened well together.

THE LUCE CANE HARVESTER.

It will be remembered that both at the Conference of sugar-growers convened by the Government, and at the council meetings of the Australian Sugar Producers' Association, reference has been made to the importance of securing definite information as to the adaptability of the Luce Cane Harvester to the necessities of the Queensland canegrower. We have never heard that this is a miller's question in any special sense; but it is a fact that the association has devoted much time and attention to the possibility of securing a thorough trial of the machine under Queensland conditions. Perhaps next time some of our opponents are casting around for proof of the one-sidedness of this organisation, they will not forget its work in connection with the Luce Harvester. But what they started out to deal with is an article in the "Louisiana Planter" of 31st August, giving a general review of the sugar situation in Queensland, basing its remarks on information evidently gleaned from the columns of "The Australian Sugar Journal." In this article, which is wholly of a friendly tone, there is a reference which will be read with interest here. The writer says:—

"The loss of the kanaka labour, and the making of Queensland a white man's country made the cutting of cane in the field alone cost over a dollar a ton. (How much more?—Editor.) It is suggested that the Government should buy a Luce Cane Harvester for its own account, taking it out to Queensland, and exploiting it there under Queensland conditions, which, of course, would be desirable, if not absolutely necessary, as all such machines must be adapted to any peculiarities of the conditions under which they are to work."

Drawing a parallel from experience in the use of rice harvesting machinery in Louisiana, the writer adds,—"Just such a line of reasoning is urged for the cane fields of Queensland, Australia, where labour is securing probably a higher reward for its services than is given anywhere else on earth, excepting (sic) perhaps it be in Louisiana."

The Australian Sugar Producers' Association has already set on foot inquiries from authoritative sources in Hawaii and in America, and it is hoped that useful information may shortly be available on which to base definite action towards the objects in view, namely, the actual trial of the machine in Queensland, should its record elsewhere justify further expense.—"Queensland Sugar Journal," 7th November.

THE SUGAR CROP ESTIMATE.

The General Superintendent of the Bureau of Sugar Experiment Stations (Mr. H. C. Easterby) states that he has now received the midseason's estimates of the tonnage of cane expected to be put through the rollers this season. If matters run smoothly it is anticipated that approximately 1,801,200 tons of cane will be crushed this year. Allowing $8\frac{1}{4}$ tons of cane to 1 ton of sugar, then the tonnage of raw sugar to be manufactured in Queensland should be about 206,000. The Commonwealth consumption is now stated to be 283,000 tons, a large increase on the two previous years, but no doubt due to the export of sugar in jams. This would leave a deficiency of 77,000 tons. Assuming that New South Wales makes about 20,000 tons, this would still leave a shortage of some 57,000 tons. The present probabilities are that next year's shortage will be still greater.

USE OF MOLASSES FOR STOCK.

Considerable anxiety has been occasioned in some of the sugar districts, owing to the currency of a report that, under legislation recently introduced in the Queensland Assembly, farmers and others would no longer be able to procure molasses from the mills for the purposes of stock feeding. From inquiry, we are able to state that there is no truth in this report. The Stock Foods Bill, recently submitted to Parliament, and which, by the way, cannot be dealt with until next session, does not affect the sale of molasses as such. It deals only with "concentrated or prepared stock food," together with hay and chaff.—"Queensland Sugar Journal."

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR NOVEMBER, 1918.

Article.								OCTOBER.
								Prices.
Bacon	...	...	...	...	...	...	lb.	9d. to 10d.
Barley	...	...	...	...	...	...	bush.	4s. 9d.
Bran	...	...	...	...	...	...	ton	£4
Broom Millet	...	...	...	...	...	...	"	£30 to £50
Broom Millet (Sydney price)	...	...	...	...	...	...	"	£60
Butter (First Grade)	...	...	...	...	...	...	cwt.	154s.
Chaff, Mixed	...	...	...	...	...	...	ton	£9
Chaff, Oaten	...	...	...	...	...	...	"	£9 to £10
Chaff, Lucerne	...	...	...	...	...	...	"	£5 to £14
Chaff, Wheaten	...	...	...	...	...	...	"	£6 10s. to £8
Cheese	...	...	...	...	...	...	lb.	11½d.
Flour	...	...	...	...	...	...	ton	£12
Hams	...	...	...	...	...	...	lb.	1s. 6d. to 2s.
Hay, Oaten	...	...	...	...	...	...	ton	...
Hay, Lucerne	...	...	...	...	...	...	"	£8 to £10
Hay, Wheaten	...	...	...	...	...	...	"	£9 5s.
Honey	...	...	...	...	...	...	lb.	3½d. to 5d.
Maize	...	...	...	...	...	...	bush.	5s. 11d. to 6s.
Oats	...	...	...	...	...	...	"	3s.
Onions	...	...	...	...	...	...	ton	£39
Peanuts	...	...	...	...	...	...	lb.	9d. to 1s.
Pollard	...	...	...	...	...	...	ton	£5 10s.
Potatoes	...	...	...	...	...	...	"	£18 10s. to £19 10s.
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	5s. 3d. to 6s. 2d.
Pumpkins (Cattle)	...	...	...	...	...	...	ton	£13 to £16
Eggs	...	...	...	...	...	...	doz.	8½d. to 11d.
Fowls	...	...	...	...	...	...	per pair	4s. to 8s.
Ducks, English	...	...	...	...	...	...	"	4s. to 5s. 6d.
Ducks, Muscovy	...	...	...	...	...	...	"	4s. to 7s. 6d.
Geese	...	...	...	...	...	...	"	8s. to 10s.
Turkeys (Hens)	...	...	...	...	...	...	"	5s. 6d. to 14s.
Turkeys (Gobblers)	...	...	...	...	...	...	"	18s. to 27s. 6d.
Wheat (Milling)	...	...	...	...	...	...	bush.	4s. 8d. to 4s. 10d.

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...	...	...	...	...	...	5s. to 12s.
Beans, per sugar-bag	...	...	...	...	...	...	10s. to 15s. 6d.
Beetroot, per dozen bundles	...	...	...	...	...	...	1s. to 2s.
Cabbages, per dozen	...	...	...	...	...	...	10s. to 15s.
Carrots, per dozen bunches	...	...	...	...	...	...	1s. to 1s. 6d.
Cucumbers, per dozen	...	...	...	...	...	...	1s. to 2s. 3d.
Lettuce, per dozen	...	...	...	...	...	...	1s. to 1s. 3d.
Marrows, per dozen	...	...	...	...	...	...	3s. to 7s. 6d.
Parsnips, per dozen bunches	...	...	...	...	...	...	1s. 6d. to 3s.
Peas, per sugar-bag	...	...	...	...	...	...	10s. to 15s.
Sweet Potatoes, per sugar-bag	...	...	...	...	...	...	1s. 6d. to 2s. 6d.
Tomatoes, per quarter-case	...	...	...	...	...	...	7s. to 10s.

SOUTHERN FRUIT MARKETS.

Article.	NOVEMBER.	
	Prices.	
Bananas (Queensland), per case	12s. to 15s.
Bananas (Tweed River), per case	10s. to 15s.
Bananas (Fiji), per bunch	10s. to 12s.
Bananas (G.M.), per bunch	5s. to 6s. 6d.
Bananas (G.M.), per case	22s.
Cherries, per 12lb. box	24s.
Lemons (Local), per bushel-case	4s. to 5s.
Mandarins, per bushel-case	20s.
Oranges (Navel), per case	24s.
Oranges (Other), per case	5s. to 11s.
Oranges (Queensland), per case
Papaw Apples, (Queensland), per case	12s.
Passion Fruit, per bushel-case	30s.
Pineapples (Queens), per double-case	10s. to 12s.
Pineapples (Ripleys), per double-case	8s. to 9s.
Pineapples (Common), per double-case	7s. to 8s.
Tomatoes (Queensland), per half-case	2s. to 6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Apples, Eating, per case ...	...	13s. to 17s.
Apples, Cooking, per case ...	...	10s. to 14s.
Bananas (Cavendish), per dozen ...	...	2d. to 5d.
Bananas (Sugar), per dozen ...	...	2d. to 6d.
Cape Gooseberries, per quart ...	...	9d.
Cherries, per case ...	...	7s. to 20s.
Citrons, per hundredweight ...	...	16s.
Cocoanuts, per sack ...	...	15s. to 25s.
Custard Apples, per quarter-case ...	...	...
Lemons (Lisbon), per case ...	...	10s. to 15s.
Mandarins, per case ...	...	...
Mangoes, per case ...	...	6s. to 9s.
Oranges (Navel), per case ...	...	...
Oranges (Seville), per hundredweight ...	...	12s.
Oranges (Other), per case ...	...	12s. to 16s.
Papaw Apples, per half-bushel-case ...	...	1s. 6d. to 3s. 6d.
Passion Fruit, per quarter-case ...	...	8s. to 10s.
Peanuts, per lb. ...	...	9d. to 1s.
Pineapples (Ripley), per dozen ...	...	1s. 6d. to 6s.
Pineapples (Rough), per dozen ...	...	1s. 6d. to 6s.
Pineapples (Smooth), per dozen ...	...	1s. to 4s. 9d.
Strawberries, per dozen boxes ...	...	3s. to 9s.
Tomatoes, per quarter-case ...	...	7s. to 9s. 6d.

TOP PRICES, ENOGGERA YARDS, OCTOBER, 1918.

Animal.	OCTOBER.	
	Prices.	
Bullocks	£27 17s. 6d. to £33 15s.
Cows	£17 12s. 6d. to £21
Merino Wethers	42s. 6d.
Crossbred Wethers	44s.
Merino Ewes	34s.
Crossbred Ewes	32s. 3d.
Lambs	34s.
Pigs (Bacon)
Pigs (Porkers)	38s. 6d.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF OCTOBER, 1918, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING OCTOBER, 1918 AND 1917, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Oct.	No. of Years' Records.	Oct., 1918.	Oct., 1917.		Oct.	No. of Years' Records.	Oct., 1918.	Oct., 1917.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	0·94	17	0·25	4·17	Nambour	3·27	22	0·42	1·77
Cairns	2·08	36	0·15	7·21	Nanango	2·42	36	1·02	1·97
Cardwell	2·02	46	0·14	8·00	Rockhampton ...	1·86	31	0·01	1·53
Cooktown	1·17	42	Nil	1·30	Woodford	2·74	31	1·00	1·09
Herberton	0·94	31	0·20	1·19					
Ingham	1·55	26	1·24	1·95	<i>Darling Downs.</i>				
Innisfail	3·11	37	0·96	5·04	Dalby	2·15	48	1·51	1·22
Mossman	3·76	10	0·34	4·99	Emu Vale	2·46	...	1·06	2·72
Townsville	1·24	47	Nil	0·37	Jimbour	1·92	...	1·59	0·96
<i>Central Coast.</i>					Miles	2·05	33	0·88	2·78
Ayr	0·93	31	0·02	0·32	Stanthorpe	2·68	45	1·24	2·87
Bowen	1·08	47	Nil	0·54	Toowoomba	2·73	46	1·78	2·92
Charters Towers ...	0·69	36	0·06	0·70	Warwick	2·35	31	0·87	2·57
Mackay	1·93	47	Nil	0·91					
Proserpine	1·89	15	0·52	1·02	<i>Maranoa.</i>				
St. Lawrence	1·91	47	0·15	3·13	Roma	1·76	44	1·11	1·39
<i>South Coast.</i>									
Biggenden	2·35	...	0·03	1·20	<i>State Farms, &c.</i>				
Bundaberg	2·20	35	0·04	2·39	Bungeworgorai ...	1·32	4	0·84	1·86
Brisbane	2·68	67	1·14	1·58	Gatton College ...	2·42	...	0·68	1·21
Childers	2·23	23	0·10	1·68	Gindie	1·55	5	0·04	0·05
Crohamhurst	3·57	25	0·80	1·67	Hermitage	2·08	...	0·98	2·39
Esk	2·46	31	0·92	2·86	Kairi	1·38	4	...	3·35
Gayndah	2·45	47	0·36	1·51	Kamerunga	1·75	...	Closed	3·30
Gympie	2·77	48	0·99	0·56	Sugar Experiment Station, Mackay	1·85	...	Nil	0·82
Glasshouse M'tains	3·13	10	0·33	1·55	Warren	2·93	4	Nil	1·19
Kilkivan	2·76	39	0·21	0·56					
Maryborough	2·79	47	0·55	1·79					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for October this year, and for the same period of 1917, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE.

1918.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6·3	5·34	5·29	5·47	4·59	6·5	4·46	6·28	The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania. H. M. 5 Sept. ● New Moon 8 44 p.m.
2	6·2	5·34	5·27	5·47	4·58	6·5	4·46	6·28	
3	6·1	5·35	5·26	5·48	4·57	6·6	4·46	6·29	14 „ ☾ First Quarter 1 3 a.m.
4	6·0	5·35	5·25	5·48	4·56	6·7	4·46	6·30	20 „ ○ Full Moon 11 1 p.m.
5	5·59	5·36	5·24	5·49	4·55	6·8	4·46	6·31	27 „ ☾ Last Quarter 2 39 p.m.
6	5·58	5·36	5·22	5·50	4·54	6·9	4·46	6·32	The Moon will be farthest from the earth on the 8th, and nearest to it on the 21st.
7	5·57	5·36	5·21	5·50	4·54	6·9	4·46	6·32	
8	5·56	5·37	5·20	5·51	4·53	6·10	4·46	6·33	5 Oct. ● New Moon 1 5 p.m.
9	5·54	5·37	5·19	5·51	4·53	6·10	4·46	6·34	
10	5·53	5·38	5·18	5·52	4·52	6·11	4·47	6·35	13 „ ☾ First Quarter 3 0 p.m.
11	5·52	5·38	5·17	5·52	4·52	6·12	4·47	6·35	20 „ ○ Full Moon 7 35 a.m.
12	5·51	5·39	5·16	5·52	4·51	6·13	4·47	6·36	27 „ ☾ Last Quarter 3 35 a.m.
13	5·50	5·39	5·16	5·53	4·51	6·13	4·48	6·36	The Moon will be farthest from the earth on the 6th, and nearest to it on the 20th.
14	5·49	5·40	5·15	5·53	4·50	6·14	4·48	6·37	
15	5·47	5·40	5·15	5·53	4·50	6·15	4·49	6·37	4 Nov. ● New Moon 7 2 a.m.
16	5·46	5·41	5·14	5·54	4·49	6·16	4·49	6·38	
17	5·45	5·41	5·13	5·54	4·49	6·17	4·50	6·38	12 „ ☾ First Quarter 2 46 a.m.
18	5·44	5·41	5·12	5·55	4·48	6·17	4·50	6·39	18 „ ○ Full Moon 5 33 p.m.
19	5·43	5·42	5·11	5·55	4·48	6·18	4·50	6·39	25 „ ☾ Last Quarter 8 25 p.m.
20	5·42	5·42	5·10	5·56	4·48	6·19	4·51	6·40	The Moon will be farthest from the earth on the 2nd and 29th, and nearest on the 17th.
21	5·41	5·43	5·9	5·56	4·48	6·20	4·51	6·40	
22	5·40	5·43	5·8	5·57	4·47	6·21	4·52	6·41	4 Dec. ● New Moon 1 19 a.m.
23	5·39	5·44	5·7	5·58	4·47	6·21	4·52	6·41	
24	5·37	5·44	5·7	5·58	4·47	6·22	4·53	6·42	11 „ ☾ First Quarter 12 31 p.m.
25	5·36	5·44	5·6	5·59	4·47	6·23	4·54	6·42	18 „ ○ Full Moon 5 18 a.m.
26	5·35	5·45	5·5	5·59	4·46	6·24	4·54	6·43	25 „ ☾ Last Quarter 4 31 p.m.
27	5·33	5·45	5·4	6·0	4·46	6·25	4·55	6·43	The Moon will be nearest to the earth on the 15th, and farthest from it on the 27th. There will be an annular or ring-shaped Eclipse of the Sun on 3rd December, but it will not be visible in Australia.
28	5·32	5·46	5·3	6·1	4·46	6·25	4·55	6·44	
29	5·31	5·46	5·2	6·2	4·46	6·26	4·56	6·44	
30	5·30	5·46	5·1	6·3	4·46	6·27	4·56	6·45	
31	...	...	5·0	6·4	...	...	4·57	6·45	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during September, October, and November may be roughly arrived at by adding 16 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night, when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Orchard Notes for January.

THE SOUTHERN COAST DISTRICTS.

The fruit of the month in this part of the State is the grape, and its gathering and marketing will occupy the attention of growers. Care should be taken to cut the fruit when cool and dry, and if it has to be sent any distance the stems of the bunches should be allowed to wilt before the fruit is packed, as the berries will then hang on to the bunch better, and the bunch carry in better order. Select the fruit carefully, grade it, and pack firmly so that it will not bruise in transit. If to be sent long distances, pack in crates holding from four to six 6-lb. baskets. Pines will be ripening in quantity towards the end of the month. Gather before fully coloured, and, whether for Southern or local markets, pack and handle carefully to prevent bruising. Do not ship the fruit too green for the Southern markets, as doing so is apt to spoil the trade. Send good fruit to the canneries. Small pines and crippled fruit are no good to canners, and the sooner our growers realise that it only pays to grow good fruit the better for them and for the canners, as if the latter cannot get good fruit it is impossible for them to put a line of goods that will not only be a credit to the State, but for which a world-wide market can be obtained.

Passion fruit should not be allowed to lie about for days on the ground before gathering, as if so they are apt to become fly-infested.

Watermelons and rock melons are still in season.

Watch any late peaches, Japanese plums, or other fruits liable to be infested with fruit-fly, and gather and destroy all infested fruit, or, better still, grub the trees out and burn them as they only breed flies to destroy more valuable fruit. Mangoes will be ripening during the month. See that all fly-infested fruits are destroyed, as they will only breed up further crops to destroy later ripening fruits.

Citrus orchards can be cyanided during the month for scale insects, and spraying for Maori with the sulphide of soda wash should be continued where necessary.

Mangoes can be budded during the month, as well as citrus and deciduous trees. Tropical fruit trees can be transplanted, taking care to choose dull weather and to cover same from the direct rays of the sun till they have become firmly established. Pines and bananas can still be planted.

THE TROPICAL COAST DISTRICTS.

See that all bananas are covered with netting, as the fly is usually at its worst at this time of year.

Mangoes will be going off. See that they are not allowed to remain about on the ground to breed flies for the autumn crop of oranges. Longan, litchi, and other fruit are in season. As the month is often a very wet one, little cultivation can be done in the orchards. Strong undergrowth should, however, be kept down with a hoe or scythe. Tropical fruits of all sorts can be planted. Look out for Maori on citrus fruits, and spray when necessary.

THE SOUTHERN AND CENTRAL TABLELANDS.

January is a busy month in the Stanthorpe district, apples, pears, plums, peaches, and nectarines being in season. Do not gather the fruit too immature; at the same time, don't allow it to be over-ripe. Gather dry, handle carefully, grade and pack

in attractive cases. Keep the fruit as cool as possible, and ship in well-ventilated cars. Keep a sharp lookout for fruit-fly, and take every possible means to prevent its spreading, even going as far as to gather and destroy the whole of the fruit on any infected trees, as if kept in check during the month the bulk of the fruit ripening during February will be free.

Keep a sharp lookout also for codling moth; examine the bandages on the trees at least every ten days, and destroy all larvæ found therein; also gather and destroy all moth-infected fruit.

Gather Bartlett pears as soon as they are large enough, and store away in a cool shed to ripen; when they show signs of ripening, market, not before. If sent down green they will sell for cooking, and only fetch a small price. The right stage at which to gather is when the fruit is fully developed, and the flesh has lost its woody flavour, but is still quite hard. This is usually before the fly has stung it, and if gathered at this stage the fruit will ripen up properly without shrivelling, and develop its full flavour.

These remarks apply also to the Downs country, which is somewhat earlier than Stanthorpe.

The crop of the month in the Western tablelands is the grape; and the remarks I have made respecting this fruit when grown in the Southern Coast districts apply equally here. The fruit should be gathered dry, and wilted before it is packed. Too large cases are often used; cases holding from 20 to 30 lb., or crates holding six 6-lb. baskets, are preferable, the latter being the best package for shipping the fruit long distances. Keep the orchards well cultivated, and, where water for irrigation is available, give citrus trees a watering during the month, unless there has been a sufficient rainfall. When the orchard is irrigated, see that thorough cultivation follows the irrigation, so as to conserve the moisture in the soil.

Red Scale, which is prevalent on citrus trees in the dry Western country, should be treated during the month. Cyaniding is the best remedy.

Farm and Garden Notes for January.

FIELD.—The main business of the field during this month will be ploughing and preparing the land for the potato and other future crops, and keeping all growing crops clean. Great care must be exercised in the selection of seed potatoes to ensure their not being affected by the Irish blight. Never allow weeds to seed. This may be unavoidable in the event of long-continued heavy rains, but every effort should be made to prevent the weeds coming to maturity. A little maize may still be sown for a late crop. Sow sorghum, imphee, Cape barley, vetches, panicum, teosinte, rye and cowpeas. In some very early localities potatoes may be sown, but there is considerable risk in sowing during this month, and it may be looked upon merely as an experiment. Plant potatoes whole. Early-sown cotton will be in bloom.

KITCHEN GARDEN.—A first sowing of cabbages, cauliflower, and Brussels sprouts may now be made in a covered seed bed, which must be well watered and carefully protected from insect pests. Sow in narrow shallow drills; they will thus grow more sturdy, and will be easier to transplant than if they were sown broadcast. The main points to be attended to in this early sowing are shading and watering. Give the beds a good soaking every evening. Mulching and a slight dressing of salt will be found of great benefit. Mulch may consist of stable litter, straw,

grass, or dead leaves. Dig over all unoccupied land, and turn under all green refuse, as this forms a valuable manure. Turn over the heavy land, breaking the lumps roughly to improve the texture of the soil by exposure to the sun, wind, and rain. In favourable weather, sow French beans, cress, cauliflower, mustard, cabbage, celery, radish for autumn and winter use. Sow celery in shallow well-drained boxes or in small beds, which must be shaded till the plants are well up. Parsley may be sown in the same manner. Turnips, carrots, peas, and endive may also be sown, as well as a few cucumber and melon seeds for a late crop. The latter are, however, unlikely to succeed except in very favourable situations. Transplant any cabbages or cauliflowers which may be ready. We do not, however, advise such early planting of these vegetables, because the fly is most troublesome in February. For preference, we should defer sowing until March. Still, as "the early bird catches the worm," it is advisable to try and be first in the field with all vegetables, as prices then rule high. Cucumbers, melons, and marrows will be in full bearing, and all fruit as it ripens should be gathered, whether wanted or not, as the productiveness of the vines is decreased by the ripe fruit being left on them. Gather herbs for drying; also garlic, onions, and eschalots as the tops die down.

FLOWER GARDEN.—To make the flower-beds gay and attractive during the autumn and winter months is not a matter of great difficulty. Prepare a few shallow boxes. Make a compost, a great part of which should consist of rotten leaves. Fill the boxes with the compost; then sow thinly the seeds of annuals. Keep the surface of the soil moist, and when the young seedlings are large enough to handle lift them gently one by one with a knife or a zinc label—*never pull them up by hand*, as, by so doing, the tender rootlets are broken, and little soil will adhere to the roots. Then prick them out into beds or boxes of very light soil containing plenty of leaf mould. Then keep a sharp lookout for slugs and caterpillars. Keep a supply of tobacco dust on hand, and scatter this in the path of the slug, and he will cease from troubling you.

All kinds of shrubby plants may be propagated by cuttings. Thus, pelargoniums, crotons, coleus, and many kinds of tropical foliage plants can be obtained from cuttings made this month. After putting out cuttings in a propagating frame, shade them with a piece of calico stretched over it. Be careful not to over-water at this season. Propagate verbenas, not forgetting to include the large scarlet Foxhunter. Verbenas require rich soil. Palms may be planted out this month. If the weather prove dry, shade all trees planted out. With seed-boxes, mulch, shade, water, and kerosene spray, all of which imply a certain amount of morning and evening work, the flower garden in autumn and winter will present a charming sight, and will afford light and profitable work for girls with spare time on their hands.

An exhaustive booklet on "Flower Gardening for Amateurs" has been issued by the Department of Agriculture and Stock, and may be obtained from the Office. Price, 2s.

Another useful publication is "Market Gardening in Queensland." Price, 1s, also issued by the Department.

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